

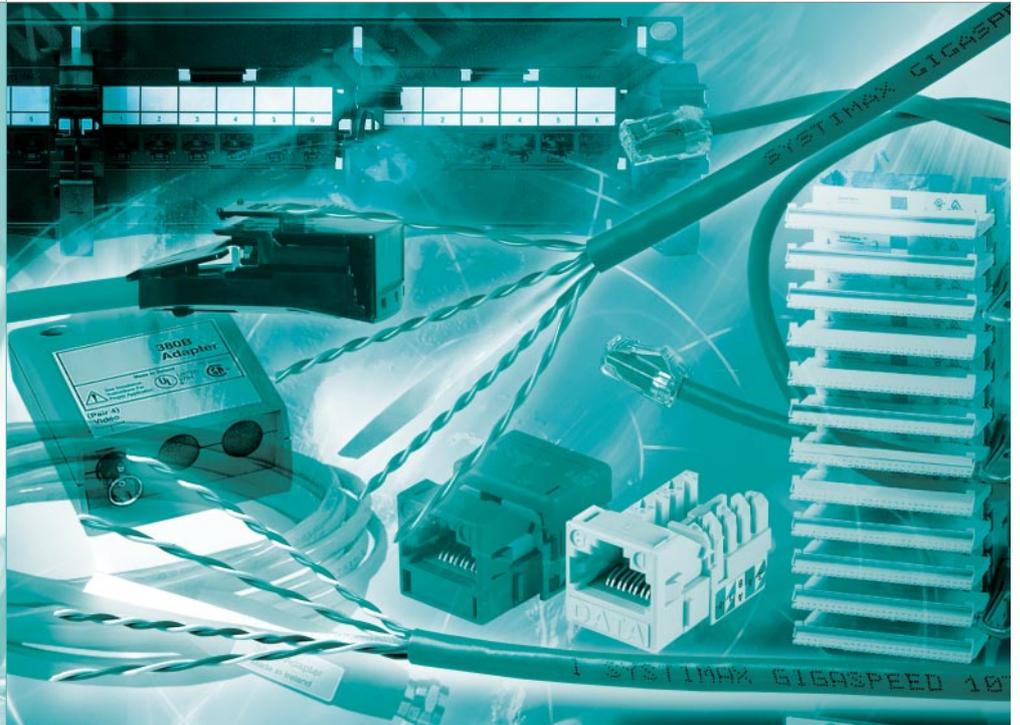
# SYSTIMAX<sup>®</sup>

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## SOLUTIONS

### SYSTIMAX<sup>®</sup> Copper Solutions

#### Designed for the Digital Generation



SYSTIMAX<sup>®</sup> Structured Connectivity Solutions

[www.systemax.com](http://www.systemax.com)

**SYSTIMAX® Solutions is the global leader in the enterprise cabling sector with a proven track record of advancing network performance.**

- 1,000 miles (1,600 km) of cable installed every day
- 140,000 connectors installed daily
- Sold in more than 120 countries worldwide
- Manufactured on three continents
- Supported by approximately 2,500 highly skilled BusinessPartners
- Industry-leading guarantees

## Network Performance for Business Advantage

With the average employee spending 22 hours a week at their PC<sup>1</sup> and 80 percent of them using a network<sup>2</sup>, desktop communications are now vital to the success of the enterprise. And, as new network intensive productivity software is introduced, the quality of connectivity at the desktop will be decisive in achieving a competitive edge.

Higher performance network connections mean a higher performing business because everyone in the organization can work quicker and better. They can share information more easily and have greater scope to collaborate with colleagues and customers. They can also benefit from innovations and new ideas that depend on fast communication - without worrying that the network will be too slow or unreliable.

The network is the key to competitive advantage, and the foundation for network performance and reliability is the cabling infrastructure. When an organization must compete more strongly and operate more efficiently, it needs cabling to the desktop that allows this to be achieved.

The good news is that the cabling technologies required to advance network performance are already available. The SYSTIMAX® PowerSUM and GigaSPEED® XL Solutions deliver communications throughput and reliability to help every organization handle today's pressures and tomorrow's challenges. They have also provided the blueprints for international standards that are accelerating global acceptance of new cabling technology.

The Category 5e/Class D standard for copper cabling to support networking at 100 Mb/s or 1 Gb/s is now well established and universally accepted. More recently, it has been complemented by the Category 6/Class E standard for cabling suited to the most demanding data, video and digital voice transmission. Together these standards open the way to a new era in copper cabling, providing fast return on investment and comfortably supporting the latest data intensive and real-time applications.

Organizations around the world have already installed Category 5e cabling and are rapidly adopting Category 6. A SYSTIMAX Structured Connectivity Solutions (SCS) survey among 2,047 network and IT managers worldwide shows that more than a quarter of businesses of every size and type have installed Category 6 cabling and more than 55 percent have Category 5e solutions.

Following ratification of Category 6 by international standards bodies, 82 percent of those surveyed intend to start or continue specifying it in the future. By doing so they are laying foundations for fast networks that will ensure information flows quicker and more reliably.

## Connectivity that fits Perfectly

Every organization has its own route to a more efficient and profitable future. Factors including size, business sector, investment policy and legacy systems combine to determine what network infrastructure will best fit the business requirement. That is why the SYSTIMAX SCS portfolio has more than one copper cabling solution.

<sup>1</sup> Source: Gallup Survey Commissioned by Microsoft, August 2001

<sup>2</sup> Source: Infonetics Research Inc

We can offer customers a choice of PowerSUM and GigaSPEED XL Solutions to provide the perfect match for all of their cabling needs. Both solutions offer the highest quality products in support of robust and reliable networks, and each positioned with its own unique performance/cost levels.

Both options offer complete, single source, end-to-end solutions created from the top down. Developers at the industry-leading SYSTIMAX Labs start with the aim of achieving superior end-to-end connectivity and design every component to work in harmony to achieve this. While other suppliers assemble a collection of components from various sources, each SYSTIMAX SCS component is designed from the outset to be perfectly matched for maximum performance and reliability.

Where network intensive systems are central to business strategy and Category 6 cabling is the minimum requirement, GigaSPEED XL Solutions offer the highest performing horizontal connections commercially available. Where shorter term or lower bandwidth requirements are foreseen, the PowerSUM Solution fits the bill.

### SYSTIMAX PowerSUM Solution - True Category 5e

The PowerSUM Solution was the first cabling system in the industry designed to take into account the effects of parallel transmission schemes, which are critically important for the successful deployment of 1000BASE-T. Introduced in 1996, years before Category 5e was completed, the PowerSUM Solution is one of the highest performing Category 5e cabling channels available, significantly exceeding the standard specifications. The PowerSUM Solution proved itself to be the blueprint for the completed Category 5e standard.

Like all the SYSTIMAX product portfolio, it offers more value based on better performance. It provides bandwidth, throughput and reliability far above Category 5 products and improves on the electrical performance specified in the Category 5e standard by 100 percent.

Performance is guaranteed up to 155MHz and damaging Near End Crosstalk (NEXT) is cut in half compared to the Category 5e specification. Other harmful Far End Crosstalk (FEXT) effects are lower than the standard specification by 255%.

These performance levels not only provide generous headroom when running 100BASE-T they also mean the PowerSUM Solution is guaranteed to support the 1000BASE-T implementation of Gigabit Ethernet.

This makes the PowerSUM Solution the true Category 5e choice for applications that need high quality, fully integrated cabling without the throughput potential of Category 6 cabling. It is a complete, end-to-end solution offering a choice of cables, including Low Smoke Zero Halogen (LSZH), Plenum and non-Plenum types, matched with a range of connectors, patching hardware, cords and outlets. Every component is provided from a single source and designed to work in unison, so there are none of the compatibility issues encountered with mix-and-match cabling.



If not perfectly matched, components can reflect data signals where they join. Even if each component is Category 6 compliant, end-to-end performance can be greatly reduced.



SYSTIMAX SCS components are precision engineered to provide a generous bandwidth margin that ensures reliability through your entire channel.

## The SYSTIMAX GigaSPEED XL Solution - Beyond Category 6

In the SYSTIMAX GigaSPEED XL Solution, the simplicity and versatility of copper cabling are combined with support for the most demanding gigabit applications. Added to this, its unmatched performance over a 250MHz frequency range offers potential for multi-gigabit throughput in the future. With performance well beyond Category 6 specifications, the GigaSPEED XL Solution can be relied on to deliver a fast return on investment.

Better cable design and improved manufacturing precision have steadily increased the performance and reliability of copper cabling. Now, powerful new modal decomposition and simulation techniques developed at SYSTIMAX Labs have removed the barriers to UTP solutions with even greater throughput and reliability. Forty one patents have been granted on innovations that help the GigaSPEED XL Solution achieve a breakthrough in copper cabling performance.

The GigaSPEED XL Solution gives desktop systems industry-leading copper connectivity with less downtime and more throughput than ever before. The SYSTIMAX SCS research report mentioned earlier also confirmed that networks with higher performance cabling have less downtime. Wherever real-time data feeds, fast file transfer and streaming media play a central role in the business, a GigaSPEED XL Solution is the logical choice.

In a series of tests at SYSTIMAX Labs, the SYSTIMAX GigaSPEED XL Solution showed the scale of its advantages over multi-vendor Category 5e and Category 6 cabling. Under simulated real world interference conditions, transmitting a 90 MByte file over the GigaSPEED XL Solution took little over a third of the time needed when compared with Category 5e cabling.

The advantage of the GigaSPEED XL Solution was equally clear with streaming and serial digital video applications. Even with six connectors in the channel it provided smooth, clean moving images while a Category 5e channel failed to operate and a minimum Category 6 channel with four connectors delivered snowed and erratic images.

The GigaSPEED XL Solution includes two options, the GigaSPEED XL7 Solution guaranteed to exceed the Category 6 NEXT specification by 6 dB, and GigaSPEED XL8 Solution exceeding the standard by 7 dB. In addition, both solutions are guaranteed to exceed the Category 6 specification for other key parameters such as PSNEXT, PSELFEXT and Return Loss by considerable margin. Plenum, non-Plenum and LSZH versions of cabling are available and there is a choice of patching hardware including the intelligent SYSTIMAX iPatch™ System and the innovative SYSTIMAX VisiPatch™ System.

### The extra quality and performance of the GigaSPEED XL Solution give an organization major benefits.

- Every employee and IT system will spend less time waiting for data and more time producing.
- It enables better ways of working using new, bandwidth-intensive applications such as video conferencing and distance learning.
- It reduces network downtime and eases congestion that costs the world's businesses billions of dollars every year.

### Performance of the PowerSUM Solution

Guaranteed and Typical Margins to Category 5e/Class D Channel Specifications		
Electrical Parameter: <i>Worst Pair/Pair Combination Margins (1-155.5MHz)</i>		
	Guaranteed	Typical
<b>Insertion Loss</b>	5.0%	10.30%
<b>NEXT</b>	3.0 dB	8.8 dB
<b>PSNEXT</b>	5.5 dB	9.9 dB
<b>ELFEXT</b>	4.5 dB	10.8 dB
<b>PSELFEXT</b>	5.5 dB	11.5 dB
<b>Return Loss</b>	1.0 dB	5.5 dB

### Performance of the GigaSPEED XL Solutions

4 Connector Channels:	GigaSPEED XL7		GigaSPEED XL8	
	<i>Worst Pair Margin (1-250 MHz)</i>		<i>Worst Pair Margin (1-250 MHz)</i>	
	Guaranteed	Typical	Guaranteed	Typical
<b>Insertion Loss</b>	5.0%	6.5%	8.0%	9.5%
<b>Pr-Pr NEXT</b>	6.0 dB	9.4 dB	7.0 dB	10.9 dB
<b>PSNEXT</b>	7.5 dB	10.6 dB	8.5 dB	12.0 dB
<b>Pr-Pr ELFEXT</b>	6.0 dB	11.3 dB	8.0 dB	11.5 dB
<b>PSELFEXT</b>	8.0 dB	12.7 dB	10.0 dB	13.2 dB
<b>Return Loss</b>	4.0 dB	5.7 dB	4.0 dB	6.1 dB

GigaSPEED XL Solution performance with four connector channels.

Figures valid at any frequency of certified channel comprising GigaSPEED XL cable & apparatus.

6 Connector Channels:	GigaSPEED XL7		GigaSPEED XL8	
	<i>Worst Pair Margin (1-250 MHz)</i>		<i>Worst Pair Margin (1-250 MHz)</i>	
	Guaranteed	Typical	Guaranteed	Typical
<b>Insertion Loss</b>	4.0%	5.5%	6.5%	8.0%
<b>Pr-Pr NEXT</b>	4.0 dB	7.4 dB	5.0 dB	9.4 dB
<b>PSNEXT</b>	5.5 dB	8.5 dB	6.5 dB	10.6 dB
<b>Pr-Pr ELFEXT</b>	4.0 dB	8.9 dB	6.0 dB	9.4 dB
<b>PSELFEXT</b>	6.0 dB	10.4 dB	8.0 dB	11.0 dB
<b>Return Loss</b>	2.0 dB	5.2 dB	2.0 dB	5.9 dB

GigaSPEED XL Solution performance with six connector channels.

Figures valid at any frequency of certified channel comprising GigaSPEED XL cable and apparatus.

#### PowerSUM Solution Options

- 1061 non-Plenum, 2061 Plenum, 3061 LSZH Cables
- 110 VisiPatch System and 110 Connector System
- Enhanced PATCHMAX® and 1100 PS CAT5E Modular Patch Panels
- MPS-100E Communication Outlet
- D8PS Patch and Workstation Cords
- 110, 117, 119 Patch Cords

#### GigaSPEED XL Solution Options

- 1071 non-Plenum, 2071 Plenum and 3071 LSZH Cables
- 1081 non-Plenum, 2081 Plenum and 3081 LSZH Cables
- iPatch System and 110 VisiPatch System
- PATCHMAX and 1100 Patch Panel Options
- MGS400 Communication Outlet
- GS8E Modular Patch Cord
- 110 GS XL VisiPatch Cord

## Designing out Uncertainty

To achieve reliability, cabling designers have to minimize the many adverse electrical interactions in multi-pair cables that can distort or impede signal transmission. In an ideal universe this would be easy. There would be no imperfections in transceivers, cabling or connectors, and crosstalk effects such as NEXT, PSNEXT, ELFEXT and PSELFEXT would not exist. Nor would there be any concerns about insertion loss, return loss, delay and delay skew.

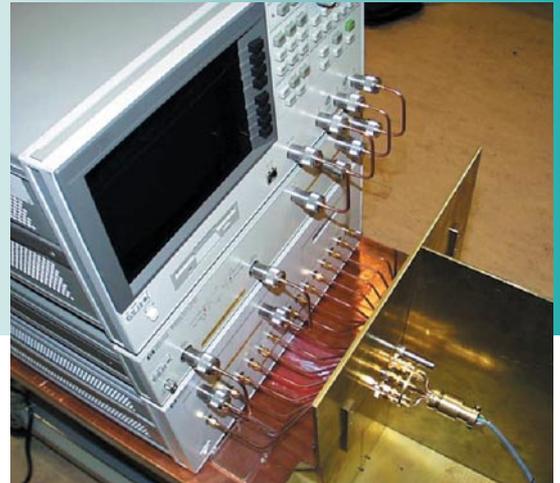
But, in the real world, all these factors can degrade transmission if they are not properly controlled. The cross couplings and imbalances between the many pairs in multi-pair cables increase this challenge even further.

After seven years' development at SYSTIMAX Labs, equipment for modal decomposition analysis of multi-conductor transmission systems is now a practical reality. The SYSTIMAX 16-port modal decomposition modeling tool measures all the unbalanced paths that can cause performance problems in a four-pair channel and ensures all coupling between pairs is taken into account. In all, this involves measuring 192 parameters.

The equipment also measures parameters defined in Category 6 specifications. These include pair-to-pair NEXT, pair-to-pair FEXT, insertion loss and return loss. From these are derived ELFEXT (Equal Level Far End Cross Talk), PSNEXT (Power Sum Near-End Cross Talk) delay and skew. Together with the 192 coupling and imbalance terms, this gives a total of 256 parameters that fully define the characteristics of a 4-pair cable, cord or connector.

With this complete picture of electrical characteristics in UTP cabling, designers were able to develop the GigaSPEED XL Solution - the first UTP Solution to remove uncertainty about the performance of planned cabling installations. Using the new GigaSPEED XL Solution, network designers know there will be no unwelcome surprises when a new cabling infrastructure becomes operational.

Modal Decomposition  
Modeling Machine



## The Best Warranty in the Industry\*

- SYSTIMAX Structured Connectivity Solutions (SCS) are backed by an industry leading 20-year extended Product Warranty and Applications Assurance.
- The SYSTIMAX SCS Applications Assurance covers applications from leading suppliers ranging from voice, video, and data to sophisticated building management systems.
- The SYSTIMAX SCS Applications Assurance guarantees worst case performance for each application, not averages or nominal values as with other suppliers' warranties. SYSTIMAX Solutions™ guarantees are clear, unambiguous and apply across the solutions' full operational frequency range for components and solutions.
- The Applications Assurance also covers future applications introduced by recognized standards bodies and user forums that specify TIA/EIA 568B or ISO/IEC 11801 components and link/channel specifications for cabling.

\* Please refer to the 'SYSTIMAX SCS Twenty Year Extended Product Warranty and Application Assurance' for a complete set of qualifying requirements and conditions.

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## SOLUTIONS

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