SureBIT
Hubbell | Mohawk

Data Centers

Healthcare

Enterprise

Education

Infrastructure Solutions for 10G and Beyond

HUBBELL®
Premise Wiring

MOHAWK
Cabling Excellence for Open Architecture

SureBIT
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The Partnership

SureBIT High Performance Systems Address Challenges for 10GBASE-T Cabling and Beyond

The SureBIT program was developed in 1998, representing one of the longest standing partnership in the structured cabling industry. With over 14 years of development, design and warranty support, SureBIT provides one of the industry's highest performing systems. SureBIT 6A Systems are center balanced to optimize performance and to deliver transparent throughput for today's intensive data traffic.

Quality

Hubbell Premise Wiring and Mohawk first developed and completed extensive test programs, then utilized third party independent test agencies to qualify individual components and systems. Hubbell/Mohawk test facilities employ the latest leading edge test equipment to measure and analyze cabling systems in traditional passive (static) and active (dynamic) test environments. Cabling systems are qualified under normal and adverse conditions. After exceeding internal test requirements, SureBIT solutions are tested and certified by Intertek Testing Services (ETL). ETL is the world's largest and most qualified independent laboratory to test both passive and active environments in a worst-case four-connector environment. This provides you with the assurance that all SureBIT systems are verified for quality.

Training

High performance and quality cabling system products are a starting point for ensuring networking reliability and performance. Network design and installation are equally important. That is why Hubbell Premise Wiring and Mohawk have developed an extensive network of the industry's leading installation companies that are trained in the latest industry standards, field-testing methodology and our mutual products/systems. Having a Hubbell MISSION CRITICAL® Installer or a Mohawk MAC (Mohawk Accredited Contractor) design and install your SureBIT cabling system guarantees the performance you demand by exceeding the most stringent industry standards.

Active Leaders Shaping the Future

Hubbell and Mohawk are both active leaders among notable industry groups making a difference in the future of network cabling.

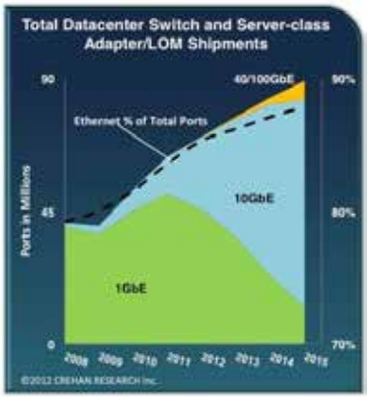
The SureBIT Advantage

Cabling Infrastructure for 10GBASE-T and Beyond

Over the past decade, Ethernet data rates have escalated to support transmission of increasing volumes of data with larger file sizes associated with cloud computing, virtualization, streaming video and other digital media content. The increase in data rates impacts how networks and cabling infrastructure are designed and deployed. Supporting today's bandwidth intensive applications has resulted in strong growth 10GBASE-T deployments. As a result, 10GBASE-T is expanding in the enterprise as well as data center applications. Active equipment manufacturers are estimating 80 million ports by the year 2015.

Major Trends Driving 10GbE Demand

- Exponential growth in data volume
- Internet traffic growth at over 30% CAGR
- More powerful data centers in support of online traffic
- Tremendous wireless data growth driven by mobile devices
- Advances in storage area networks
- Consolidation and clustering
- Server virtualization
- Increasing application speeds
- Digital media content



Key Industry Challenges

PoE	Short Link	Performance	Interoperability	AXT
				

PoE	Efficiently powering IP devices through PoE and PoE+ protocols designed to handle continuous power over time
Short Link	Supporting short length channels and links in data centers
Performance	Bandwidth beyond 10G, verified and third party tested for transmission and performance beyond TIA-568C requirements
AXT	Eliminating Alien Cross Talk (AXT), EMI and security issues
Interoperability	No space constraints, backward compatible, component compliant

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PoE

PoE

PoE+

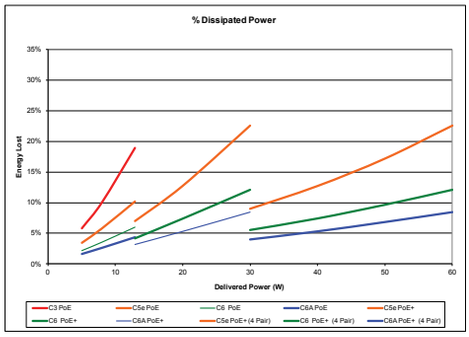
PoE++

Situation

The category of cabling has an effect on energy efficiency. Installing a Category 6A cabling infrastructure over a lower rated cabling infrastructure will have a direct impact on the bottom line for power consumption. It comes down to efficiency. Power loss combined with increased heat generation will escalate operating costs.

Challenges

- Growing deployment of IP based PoE devices generate more heat
- IEEE 802.3 PoE+ delivering 26W on two pairs
- IEEE 802.3 4-pair PoE study group targeting 50-100 watts



Benefits

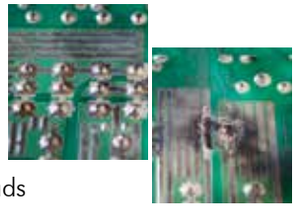
- Connecting hardware and cable designed and qualified to support IEEE PoE+ levels on all four pairs
- Improves equipment efficiency by reducing current and power levels for transceiver electronics
- Lower energy consumption to power the same application (higher efficiency)
- Lower cooling needs to overcome heat build-up in the cables
- Lower capacity and cost for power supplies and backup systems

Solution

Category 6A Systems

Hubbell

- Connectivity printed circuit boards feature traces capable of handling 550ma of current with less than 10 degrees of temperature rise
- Comply with IEC 60512-99-001 requirements ensuring contact seating surfaces are not damaged during plug/jack mating and disconnecting under remote powering loads



Mohawk

- 23 AWG copper reduces heat rise, and pair separation design improves heat dissipation
- Category 6A cables comply with TIA TSB-184

Short Link

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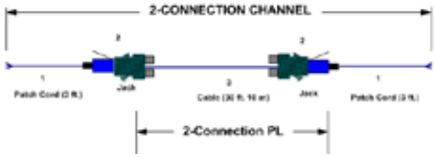
Situation

Data center deployments pose unique cabling infrastructure challenges. Up to 30% of cabling installations (or deployments) are 10 meters or less, while enterprise applications have typical link lengths of 50 to 60 meters. Short length links may generate marginal results across key performance parameters that can compromise network performance.

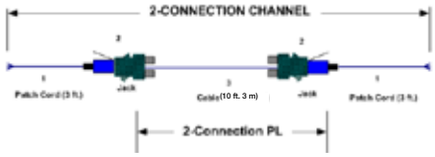
Challenges

- 30% of all cabling installations are under 10 meters
- Links and channels ranging from 2 to 100 meters
- Compliant performance in AXT, RL or NEXT measurements

TIA Standard Worst Case 10m Permanent Link



SureBIT's Worst Case 4m Permanent Link



Benefits

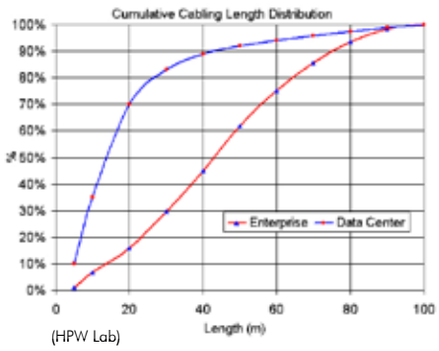
- System exceeds all Category 6A specifications
- Resolves design issues that limit distance and performance
- Cutting edge enhanced common mode design and AXT elimination techniques allow the Category 6A system to support connections between 1 and 100 meters apart, based on practical real world channel configurations

Solution

Category 6A Systems

Hubbell/Mohawk

- Superior component NEXT performance yields channels and links with significant headroom throughout the frequency range
- Shorter links and channels require component compliant connections with margin beyond the standard



(HPW Lab)

- Channel and link Return Loss are also significantly better than the standard requirements
- Improved return loss minimizes reflected power into the transmitter and reduces the power usage in the electronics

Cable Distribution

Top of Row

End of Row

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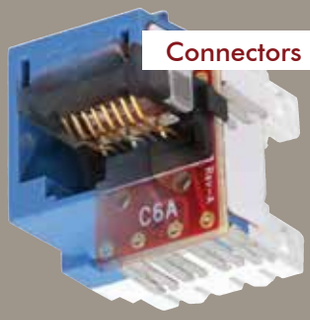
Performance Copper



Connectors

Bandwidth

Cable

Situation

Copper cabling transmission speeds have progressed from 10Mbps, to 100Mbps, to 1Gbps, to 10Gbps, and beyond (see time line below). To support today's content delivery data rate of 10 Gigabit Ethernet (10GbE), a higher performance Category 6A copper cabling system is a necessity.

Challenges

- Meeting today's bandwidth requirements—headroom is now needed at all frequencies
- Designing for component-compliance with backward compatibility and application assurance

Technology Progression Time Line

		Hubbell Cat 5	Hubbell Cat 5e	Hubbell Cat 6		Hubbell Cat 6A		Hubbell Cat 8
TIA Standards	1990 Cat 3	1995 Cat 5	1999 Cat 5e	2002 Cat 6	2006	2008 Cat 6A	2010	2015 Beyond
IEEE Applications	10BASE-T	100BASE-T	1000BASE-T		10GBASE-T		40GBASE-T	Emerging
Personal Computers	386 2MB RAM	486DX2/66 4MB RAM	400MHz Pentium II 64MB SDRAM		2.33 GHz Core 2 Duo Processor 2GB RAM		32-nanometer Microprocessors for laptops	Next Gen

Benefits

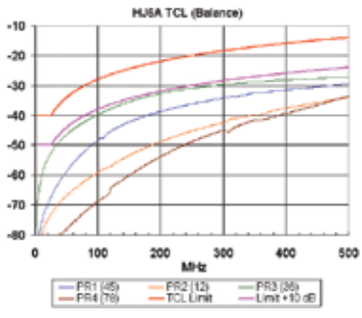
- Component performance with 7.5dB of headroom of NEXT at 500MHz allows for applications such as 10GBASE-T, a transparent path at 417MHz, eliminating bit errors and retransmissions
- The system will perform in short links, passing NEXT and RL performance in configurations typically found in Mission Critical data centers supporting application (10GBASE-T) needs from 1 to 100 meters

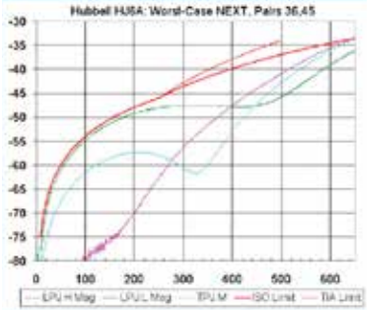
Solution

Category 6A Systems

Hubbell

- Category 6A connectivity has been tested against the most stringent limits, exceeding the TIA and ISO standards
- HJ6A's worst case NEXT of 40dB at 500MHz has more than 7.5dB better than the minimum standard





Mohawk

System NEXT performance exceeds the highest proposed industry standards by 3dB at 500MHz and performs to an extended limit clear out to 750MHz.

Performance Fiber

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Situation

High speed core data center equipment for SAN, LAN, and WAN deployments have evolved to new applications using advanced laser-based fiber transceivers and high performance fiber cabling. Interconnecting the optical core with high bandwidth laser optimized multimode, and single-mode fiber infrastructure, advances the equipment distribution area (EDA) network to new levels. The Hubbell/Mohawk fiber channel solution delivers the bandwidth and reliability needed for any Mission Critical fiber optic network.

Challenges

- Evolution from 10G to 40G and 100G applications
- Performance advancement from OM3 to OM4 laser optimized multi-mode fiber
- Future-proofing 10G installations for migration to 40G/100G applications

Benefits

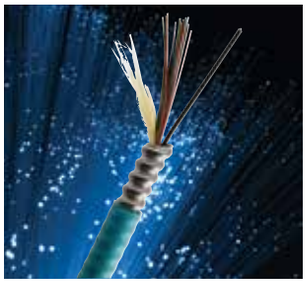
- Premium optical fiber exceeds all TIA-492, IEEE 802.3, Telcordia and ICEA standards
- High quality PROclick® no-polish field termination connectors reduce installation labor
- Advanced MPO connectivity solutions assure seamless migration to future 40G and 100G applications, in a high density space-saving footprint
- High reliability pre-terminated cable assemblies are custom made to order and 100% factory tested with fast delivery for rapid deployment

Solution

Advanced Fiber Systems

Hubbell

- Quality, high performance fiber connectivity, combined with industry-leading cable, exceeds all industry standards for reliability and applications assurance
- Hubbell's fiber warranty assures long term network integrity



Mohawk

- Premium quality, low loss, bend insensitive fiber used in all 50/125μ Mohawk cable assures performance beyond industry standards, including new 40/100G applications from IEEE 802.3
- Space-saving fiber cable, with maximum bandwidth per square inch, minimizes cable congestion in high density infrastructure deployments

10 Gig

40 Gig

100 Gig

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Interoperability

Situation

Today's complex IT environment is about empowering your entire enterprise through increased productivity, improved customer response and reduced cost of ownership. It's about leveraging new technologies for a competitive advantage, being more agile while preparing for whatever comes next. SureBIT is a comprehensive infrastructure solution delivered by a 14 year partnership with one objective—evolving your network to empower your enterprise.

Challenges

- High density solutions
- Backward compatibility
- Components designed to work together in form, fit and function, as well as performance

Benefits

- Standards component based performance provides seamless open architecture
- Designed and developed to maximize cabling system performance without sacrificing reliability
- All components are third-party verified
- SureBIT Systems are designed to support emerging technologies

Solution

Category 6A Systems

Hubbell/Mohawk

Whether your vision is small and clear or large and complex, we pride ourselves on being a trusted advisor who understands your challenges and responds with system solutions that maximize the impact of emerging technologies while preparing you for technologies to come. We will work one-on-one with you to create and maintain a long term business relationship.

SureBIT systems work seamlessly together. This dynamic versatility maximizes the value of your cabling infrastructure in ways that standalone connectivity, delivery and management systems simply can not.

AXT

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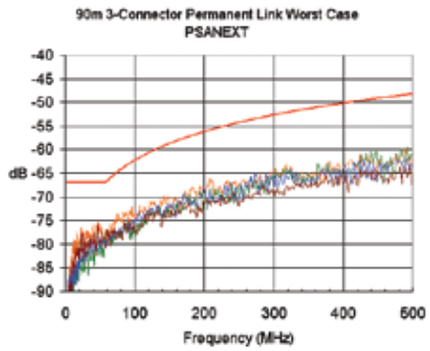
Situation

Alien crosstalk (AXT) is a critical electrical parameter limiting the performance of 10G. As the signal from one channel couples into adjacent channels, AXT occurs throughout the entire channel in neighboring cables, patch cords, jacks and patch panel ports. Extending the frequency range out to 500 MHz and defining this critical performance parameter was the basis for the Category 6A standard to support 10GBASE-T.

Challenges

- Designing a noise-free, EMI-tolerant transmission
- Eliminating AXT throughout the connectors and cabling



Benefits

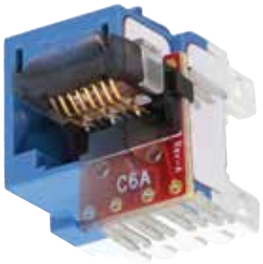
- Superior noise suppression
- Unique inner jacket to suppress AXT, ensuring maximum transmission quality and minimum bit error rate (BER)
- Standard 110 terminations with no specialized equipment
- Traditional cable installation in runs of 1 to 100 meters
- Qualified active transmission under adverse EMI conditions

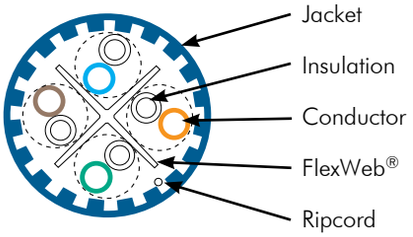
Solution

Category 6A Systems

Hubbell

- Power-sum alien near end crosstalk (PSANEXT) tested from 1 to 500MHz demonstrates headroom margins
- Component performance of the connectivity (jack and panel) exceeds all TIA/ISO standards requirements

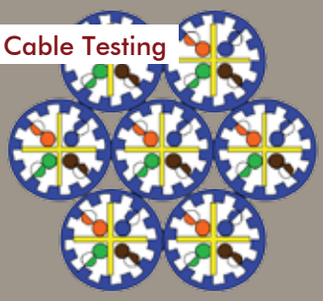




Mohawk

Unique FlexWeb® combined with patented fluted jacket construction isolates the cable pairs for outstanding pair-to-pair balance, superior headroom, and minimum crosstalk

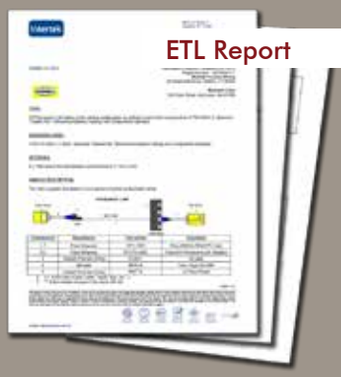
Cable Testing



AXT in Bundling

AXT Design

Warranty



ETL Report

Trained Partners

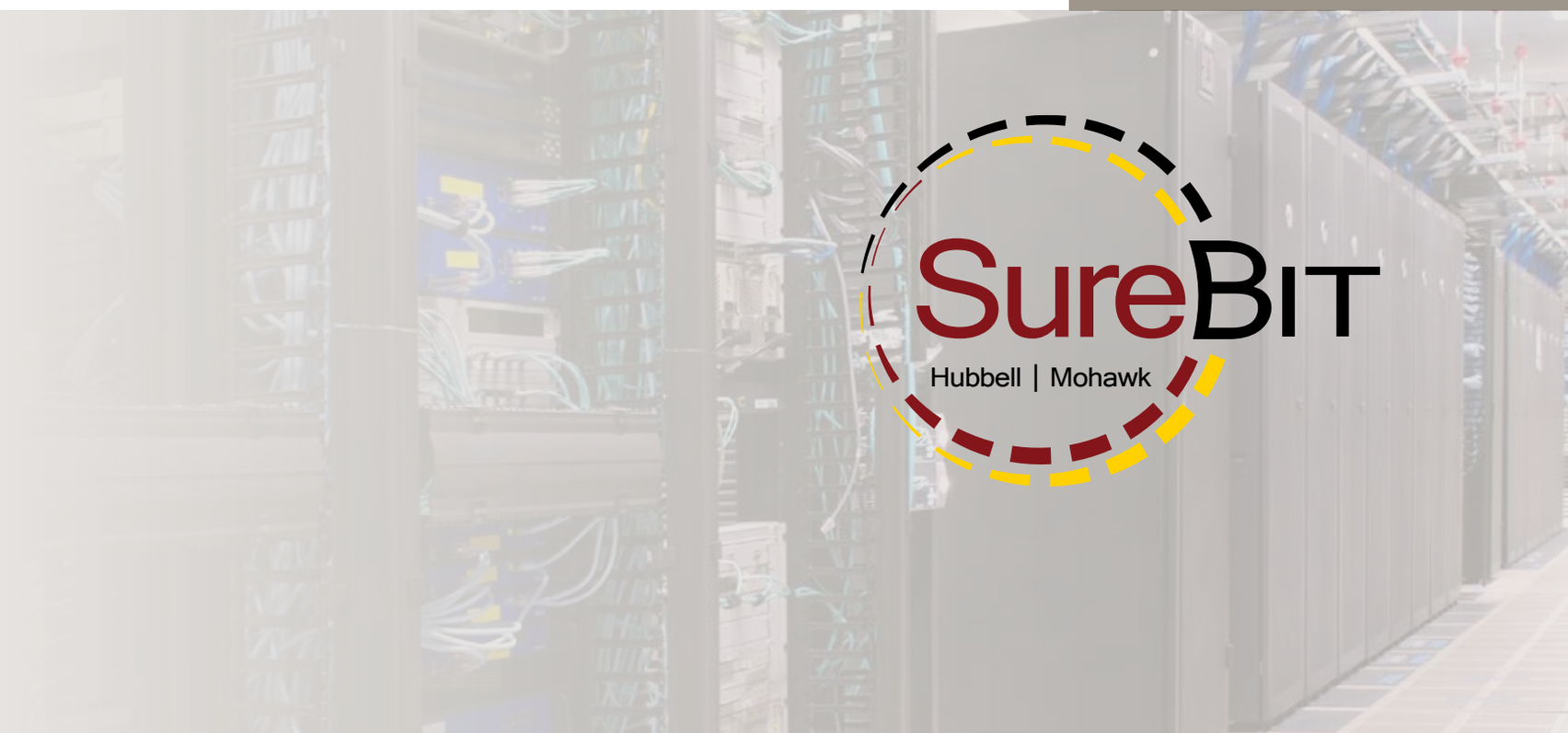
Autodesk® Seek

System SureBIT Warranty

Comprehensive Warranty Coverage and Support

Hubbell and Mohawk SureBIT Systems provide comprehensive coverage for applications and performance headroom, along with training and support services:

- Independent third party (ETL) verified performance
- SureBIT System must be registered and installed in accordance with Hubbell's Mission Critical® warranty program
- PoE+ application assurance
- Backward compatibility
- Trained, qualified network of design-install partners
- BIM models (available on Autodesk Seek; visit seek.autodesk.com)



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Hubbell and Mohawk

Combined Engineering Expertise for Enhanced Performance Systems

Established 14 year system solution partnership is the longest standing in the industry

HUBBELL PREMISE WIRING

A company committed to maintaining a tradition of excellence, delivering unmatched quality, innovation and reliability. No other company provides a broader range of products for every aspect of network connectivity.

Our reputation as an industry leader has been earned by developing high-performance systems and components that last well into the future. Hubbell's product offering is continually expanding to provide performance and installation flexibility. Our products are designed to exceed current and existing standards, so you can feel confident you have selected a product that will last well into the future.

Our highly trained sales force and distribution network have earned global recognition in the structured cabling industry. With offices in 16 countries and a distribution network that spans the globe, we make customer satisfaction our highest priority.

MOHAWK

For more than half a century, Mohawk has been a leader in wire and cable quality—surpassing all standards, while setting new ones—responding to our customers' needs and innovating in anticipation of new cable requirements and opportunities.

Today, Mohawk is again at the leading edge in the rapidly changing communications industry. To stay in front, we are constantly expanding our capabilities, and our product line, to accommodate the evolving requirements for the years ahead. In engineering design, in production technology, in quality control and customer support, we're ready to meet the needs of the next 50 years.

Headquartered in Massachusetts, Mohawk sales, marketing and engineering support teams are ready to assist you with traditional Category based solutions as well as innovative cabling approaches to your specific infrastructure requirements. With both direct and indirect outside sales personnel we are ready to provide you with sales and technical support from coast to coast.

HUBBELL®
Premise Wiring

www.hubbell-wiring.com
www.mohawk-cable.com

MOHAWK
Cabling Excellence for Open Architecture

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