



## Belden Total Enterprise Networks™

**Delivering high-performance, reliable signal transmission solutions that simplify operation and offer peace of mind.**



# Enterprise Solutions

Sending All The Right Signals  
**Innovative Solutions with Optimum Performance**  
Simplifying Building Operations  
**Seamless Integration of Enterprise Applications**  
Supporting the Needs of the Customer  
**Quality Deployments and Peace of Mind**





## Belden® Total Enterprise Networks™

Today's Enterprise facilities depend on several key operating systems to support mission-critical information systems, advanced communications networks, premise security systems and building automation and control systems. To ensure efficient, productive and secure daily operations, each of these vital systems must provide effective, reliable performance while supporting and managing the complex connectivity and networking requirements of users, devices, servers and processors in both local and remote topologies.

From the data center and LAN to building management, A/V applications and security and alarm systems, we engineer, deliver and guarantee the signal transmission solutions that provide the advanced performance and reliability that Enterprise operating systems and business processes rely on.

Based on a philosophy of providing integrated systems rather than just products, and a commitment to 'total quality' solutions rather than just warranties, we combine our technology leadership, fully integrated product and system offerings and expert service and support to provide customers with Belden Total Enterprise Networks (T.E.N.). We deliver unparalleled performance, simplified building operations and peace of mind for our Enterprise customers.

### Unparalleled Performance and Reliability

From the very start, Belden Total Enterprise Networks are designed and manufactured to provide the highest performance and greatest reliability, ensuring that the systems that control, manage and connect the Enterprise environment are operating across a solid networking foundation. Through innovation and groundbreaking technologies, our components have been specifically engineered and manufactured to work together as an end-to-end system with optimized transmission performance, ensuring that every Enterprise operating system is always sending all the right signals:

- Engineered and manufactured for highest quality and maximum performance.
- Provides unparalleled signal integrity and system reliability.



- Exceeds all applicable Industry Standards.
- Verified through comprehensive, independent third-party testing.
- Designed to support today's most demanding applications and tomorrow's emerging technologies.

### Simplified Operations

Today's Enterprise customers are striving to simplify building operations with solutions that enable multiple low-voltage applications to be seamlessly integrated over one reliable infrastructure. With wired and wireless solutions for the data center and LAN, control systems for building automation, A/V products that deliver optimum sound and video and security cables that protect and save lives, we have the experience, expertise and product offerings that span every Enterprise operating system:

- High-bandwidth copper, optical fiber and wireless systems.
- Cost-effective and optimized data center solutions.
- Reliable HVAC and environmental control cables.
- Professional-level video, sound and broadcast systems.
- Largest selection of security and alarm cables.

### Peace of Mind

Belden Total Enterprise Networks are backed by a solid reputation of integrity and an effective business model that eliminates risk and uncertainty for total customer confidence in an ever-changing world. Through our decades of experience and superior technical support, we have always provided the expert service and advice customers rely on to deploy the right infrastructure design and solution for their unique signal transmission needs.

The combination of superior Belden Systems, qualified design and installation partners, an effective distribution network and comprehensive quality assurance programs is why customers count on Belden for high performance, standards-compliant, trouble-free deployments with guaranteed performance for both today's and tomorrow's Enterprise applications:

- Decades of experience in all Enterprise operating systems.
- Superior Belden technical support and design assistance.
- Fully qualified, factory-trained network of the industry's best design and installation contractors.
- Industry-leading distribution network.
- Total quality approach for every Belden Enterprise Network, fully supported by powerful System and product warranty programs.



**Belden Total Enterprise Networks Cover All Enterprise Signal Transmission Applications**

With a total quality approach from product development to delivery and deployment, Belden is exclusively positioned to meet your unique signal transmission needs.

**Networking**

Belden has a tremendous history and unmatched experience in the design, manufacture and support of networking solutions from the data center to the desktop. The result is a full range of top quality, high performance copper, optical fiber and wireless end-to-end networking systems backed by a depth of knowledge unequalled in the marketplace. As an expert in each media type, as well as the mix of these technologies, we have the unique ability to achieve a seamless integration of your networking infrastructure for optimal voice and data transmission performance.



**Audio/Visual**

Within the broadcast industry, our cabling expertise is legendary, making us the #1 choice of production and broadcast professionals everywhere. Our leadership in the professional broadcast industries, makes us the logical choice for the high quality, high reliability A/V transmission needs of the Enterprise. Our vast range of A/V products also offers installation-easy, labor-saving benefits for a lower total cost of ownership.



**Building Management & Security**

Our cable lines for building control and security systems are best defined by their quality, value and ease of installation. And we have it all – so whether you need a basic alarm cable or a Circuit Integrity cable capable of keeping your potentially life-saving Emergency Voice/Alarm Communications (EVAC) system viable for hours in the face of both smoke and fire, we have the product and performance you need.





**Belden Total Enterprise Networks:  
Comprehensive Solutions for the Enterprise**

From the building entrance to the rooftop, and everywhere in between, Belden has the signal transmission solutions you need.

**Building Management**

To keep the environment of the Enterprise under control with all systems performing reliably and with maximum uptime, we offer an extensive range of *high quality, highly reliable cables* for your HVAC, environmental and integrated automation systems.



**Data Center**

The reliability and performance of a structured cabling system is never more critical than in the Data Center. And it's precisely here that our cabling, connectivity, enclosure and cable management products truly outperform all others, ensuring *maximum performance, maximum density, highest reliability and total manageability* in this mission-critical environment.







### Enterprise-wide Structured Cabling Systems

A whole host of innovative and ground-breaking technologies ensure that our networking solutions provide optimum network performance throughout the Enterprise. The product range is also deep, encompassing *top-quality, Belden-designed copper and optical fiber structured cabling systems, wireless systems, enclosures and cable management solutions.*

### Enterprise A/V

Absolute *signal integrity* is the hallmark of this cable line, with quality and top-performance rounding out its attributes. To guarantee design flexibility, we also offer a *wide variety of products*, taking special pride in their *easy-installation features.*

### Security

Belden offers one of the *largest, best-value* selections of security/alarm cables in the marketplace – everything from twisted-pair, multi-conductor and single-coax cable constructions to the more complex, multi-functional composite cable designs.

No other manufacturer has the breadth of products and depth of systems that Belden does – with innovation, performance and reliability guaranteed in your installation, not just in our labs.

## Offering Superior-performing Structured Cabling Solutions

### Best-in-class Copper, Optical Fiber and Wireless Solutions

No company has a better understanding of networking than we do – offering a vast array of top-quality, end-to-end network infrastructure solutions that provide guaranteed quality and performance.

These include:

#### Copper Solutions

##### IBDN System 10GX®

The best Category 6A Structured Cabling System in the industry today. Period. Its performance exceeds the TIA/EIA Category 6A standard and provides the end user with *a guaranteed throughput rate of 10 Gb/s with 625 MHz of useable bandwidth*. Our exclusive enabling technologies ensure this unprecedented, industry-leading performance (*page 12*).

##### IBDN System 4800

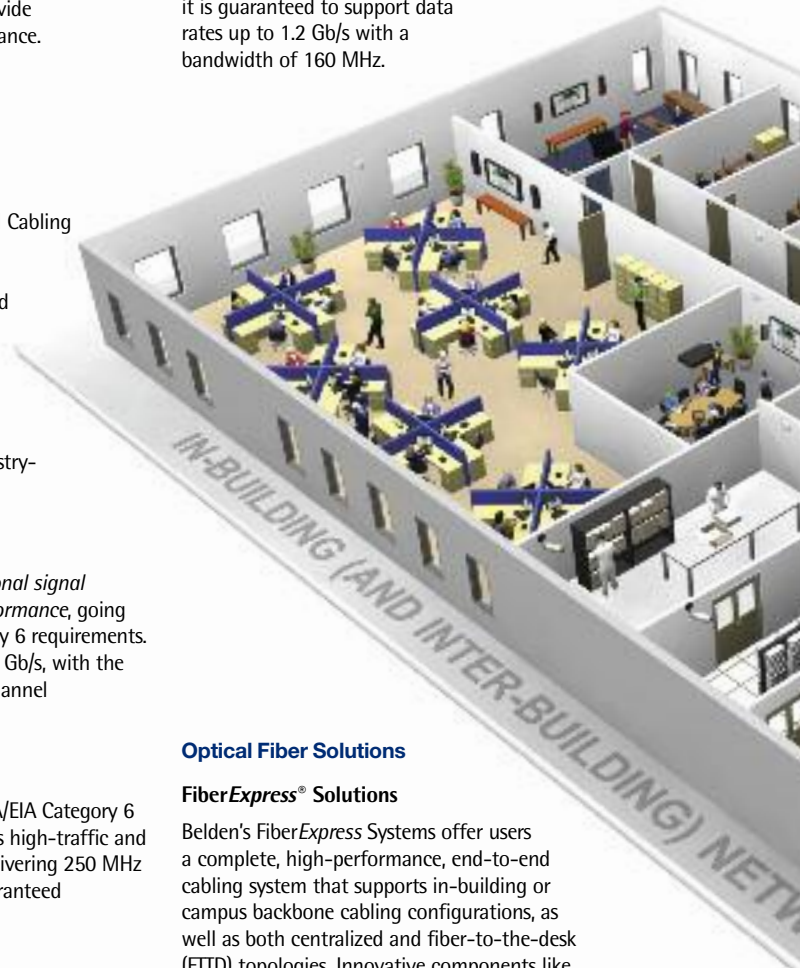
The 4800 System offers *exceptional signal power and signal-to-noise performance*, going well beyond the TIA/EIA Category 6 requirements. Throughput is guaranteed at 4.8 Gb/s, with the system providing 300 MHz of channel bandwidth.

##### IBDN System 2400

The 2400 System exceeds the TIA/EIA Category 6 requirements. It handily supports high-traffic and high-bit-rate applications by delivering 250 MHz of usable bandwidth with a guaranteed throughput rate of 2.4 Gb/s.

##### IBDN System 1200

The 1200 System is one of the industry's most powerful Category 5e systems. Substantially exceeding all TIA/EIA Category 5e requirements, it is guaranteed to support data rates up to 1.2 Gb/s with a bandwidth of 160 MHz.



#### Optical Fiber Solutions

##### FiberExpress® Solutions

Belden's FiberExpress Systems offer users a complete, high-performance, end-to-end cabling system that supports in-building or campus backbone cabling configurations, as well as both centralized and fiber-to-the-desk (FTTD) topologies. Innovative components like the Optimax® Connector (*page 12*) and the availability of factory pre-terminated systems allow for especially fast, easy, reliable installations.





## Wireless Solutions

### Trapeze Networks Wireless Solution

Belden's 802.11n-ready wireless solution fully integrates with our wired systems and allows NonStop Wireless™ operation. It delivers seamless mobility, high availability, and unparalleled reliability, performance, manageability and security to the Enterprise.

## Solving the Technical Challenges of the Data Center

Using a combination of copper and optical fiber cabling solutions, enclosures, cable management products, and power and thermal management solutions, Belden provides optimum Data Center **performance, density and manageability** – without compromise!

### Performance

With the *beyond-standards cabling system performance* guaranteed by Belden, IT managers have the flexibility to add capacity, reconfigure connections and bring new applications on line without sacrificing reliability and headroom. When it comes to installation, our pre-terminated products offer quick deployment and additional peace of mind.

### Density

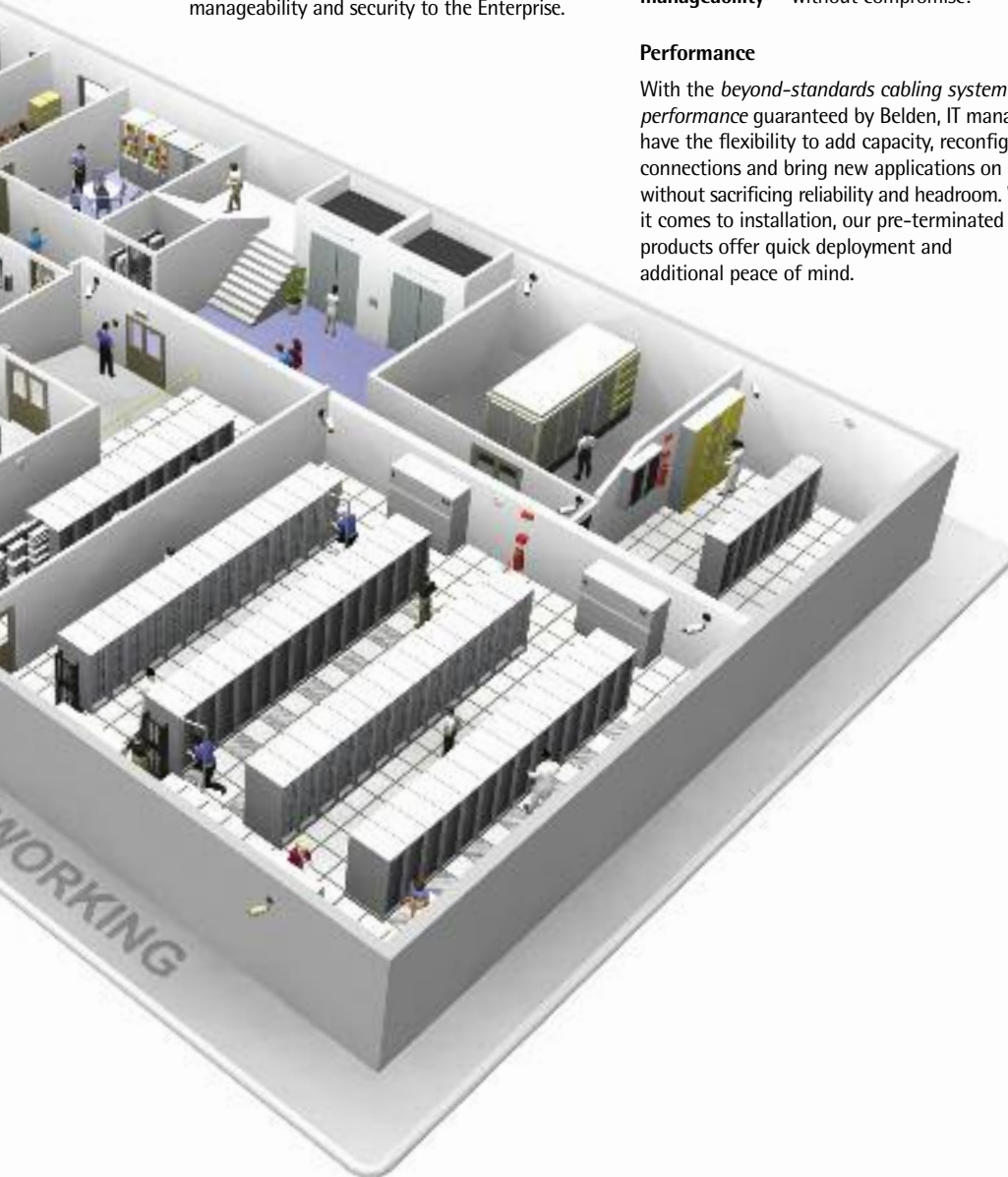
The increasing number of applications and connections supported by the data center calls for Belden's brand of *cost-effective, high-density solutions* like our FiberExpress Ultra Patch Panel system and our High-density Racking system.

### Manageability

Without manageability, disconnects, reconnects and cable rerouting can result in downtime, slower deployments and lost revenue. Belden's structured cabling system *products are designed with manageability in mind*, while our *enclosures and cable management solutions effectively protect, store and organize* cables and connections while facilitating installation.

### Minimizing Your Risk

Enterprise businesses today require "99.999" availability for their data centers with uninterrupted access to applications, and they simply can't risk choosing individual components that may not work well together, causing gaps that impact uptime and cost of ownership. Only Belden Optimized Data Center Solutions are comprised of reliable end-to-end components that have been specifically engineered and tuned together to seamlessly integrate every space within the data center. We are proud to hold leadership roles on data center related industry standards committees and organizations while providing the products, service and support necessary to make data center deployment and manageability easier and cost-effective.



## Responding to Your Building Management, Security and A/V Needs

An extensive, best-value portfolio, delivering on product quality, performance and reliability, defines our building management and audio/visual product offering.

### Controlling the Environment

Belden provides building management cables that are unequalled in their dependability and longevity.

The line also offers:

- The broadest cable selection for HVAC/ environmental control systems, primarily consisting of a substantial number of paired cables that either meet or exceed all appropriate standards.
- A highly consistent and highly repeatable product through the use of expert, statistically-controlled manufacturing techniques. Considering their design and manufacturing excellence, these cables provide the best value proposition in the marketplace.
- All OEM equipment and devices can be accommodated with our control system cables.

### Securing the Enterprise

Behind every Belden security-related cable is years of research and development and a commitment to meet the specific operational needs of the end user and the installation needs of the installer.

Key attributes include:

- Sequential footage markings and rip cords for easy installation, along with innovative designs like patented Banana Peel® jacketless composite cables that are an easy-to-install, fully integrated version of a traditional composite cable construction.
- Cables that meet the rigorous requirements of their application, like Belden Circuit Integrity Safe-T-Line® cables that provide lifesaving benefits.
- Water-blocking options and indoor/outdoor cables that eliminate junction boxes and transition from weather-tight outdoor cables to flame-retardant indoor cables, by satisfying both needs with a single cable.

Belden provides both comfort and security!





### Providing Professional-level Audio and Video Performance

For decades, Belden has been supplying A/V cables to the Olympics and a host of major sports and entertainment venues, major network and cable broadcasters such as NBC, major film studios like Lucasfilm, and a number of corporate broadcasting stations. Professionals persistently choose Belden because our products outperform all others. And that expertise translates directly to the Enterprise A/V product line.

Only Belden offers:

- An extensive, highly reliable cable offering with an unparalleled selection of precision video cables

sweep tested to 4.5 GHz for SD/HD and 3G applications and sweep-tested RGB HD Mini Hi-res coax cable bundles for projector applications.

- Unique cable constructions like the Banana Peel jacketless composite cable design, Easy Strip bonded foil constructions that speed the installation process and best-in-class foam dielectrics for superior performing video performance.
- An extensive line of A/V enclosures that provide for optimal cable performance/bandwidth through the use of our unique Quick Mount System, optimal routing flexibility with multiple attachment points and optimal installation ease to speed-up the installation process.

When you select Belden A/V products you are receiving a wealth of experience and the best cables in the marketplace, no matter what the application.



## Over a Century of Innovation

Over the years, Belden has invented or innovated a remarkable set of products with unique enabling technologies, always designed to meet your diverse applications needs.

In today's data center and LAN environments, the newest performance challenge lies in providing 10 Gb/s transmission speeds over copper-based 4-pair channels, representing a 10-fold performance increase over previous generation channels. Most manufacturers have attempted to meet this 10-fold increase by 'pumping up' or strengthening traditional product design elements, typically with disappointing or marginal results.

On the other hand, our 10GX System not only meets the 10 gigabit challenge but exceeds the requirements by providing a full 25% increase in channel bandwidth beyond the requirements of international standards. How? By innovating and inventing unique, new enabling technologies to meet the challenges rather than trying to push existing concepts beyond their capabilities.

Here are just a few of Belden's technology innovations:

### Enabling Technologies for IBDN System 10GX

A series of patented enabling technologies serve to optimize the performance of each critical component of the solution.

A sampling of these technologies includes:

#### RoundFleX Cable Design

An innovative design consisting of an internal H-web construction that keeps Alien Crosstalk at an exceptionally low level. This unique 10GX cable design is also smaller and more flexible than other Category 6A cables.

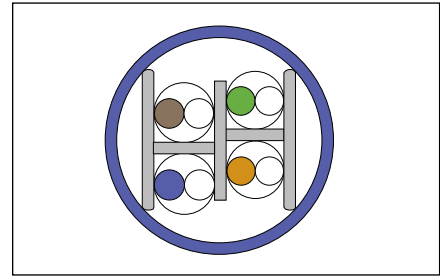
#### MatriX IDC Technology

A patent-pending IDC design and patch panel circuit layout which positions each IDC at 90 degrees to its neighbor – effectively canceling out Alien Crosstalk.

#### FleXPoint PCB Technology

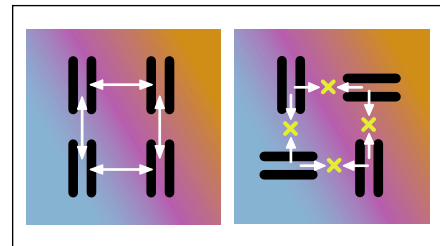
A technology innovation which utilizes a flexible printed circuit board within the module, allowing the compensation circuitry to be located directly at the point of plug contact.

#### RoundFleX Cable Design



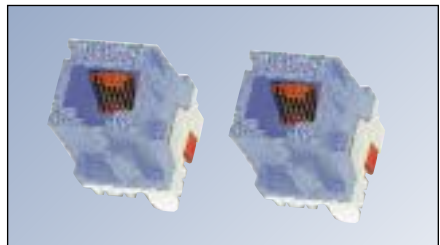
Belden's small OD 10GX cable features RoundFleX Technology, an internal H-web construction that keeps Alien Crosstalk at an exceptionally low level.

#### Traditional Technology vs. MatriX IDC Technology



By altering each pair's contact position by 90 degrees (right drawing), the "antenna" effect is effectively cancelled.

#### FleXPoint Technology



The use of a flexible printed circuit board represents a revolution in the science of 8-pin modular connectivity.



**More Groundbreaking  
Belden Technologies**

**Trapeze Wireless Architecture**

A next-generation, NonStop WLAN system built on a highly scalable distributed architecture that is optimized for voice services, seamless mobility and high availability. Backed by award-winning management software, the Trapeze Networks solution delivers unparalleled reliability, performance, manageability and security to the Enterprise.

**Optimax® Fiber Connector Technology**

The unique design of the patented mechanical splice body incorporates a factory-mounted fiber stub and a pre-polished ceramic ferrule to provide a fast, secure and reliable fiber termination in the field.

**Beldfoil® Cable Shielding Design**

The first aluminum/polyester foil developed for use as a cable shield. Provides 100% shield coverage for optimum protection.

**Duofoil® Cable Shielding Design**

Consists of an aluminum-poly-aluminum laminate wrapped around the cable's dielectric core. Provides 100% physical coverage, and improves shield reliability and flex life.

**"French Braid" Cable Shielding Design**

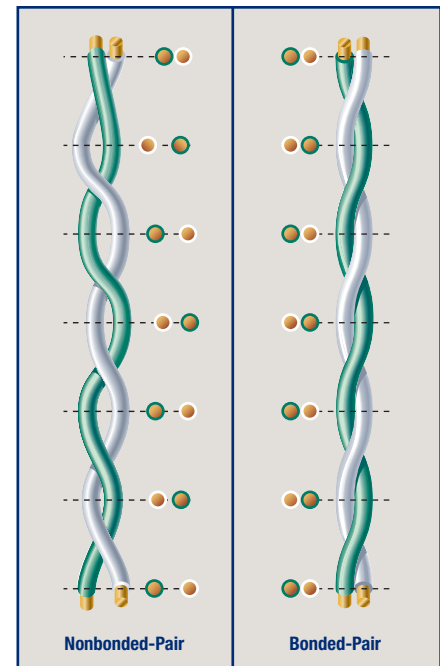
A patented shield consisting of a double spiral (double serve shield) with the two spirals tied together by one weave. This construction provides improved flex life over standard spiral shields, improved flexibility over conventional braid shields and lower levels of microphonic or triboelectric noise than either spiral or conventional braid shields.

**Bonded-Pair Cable Tehnology**

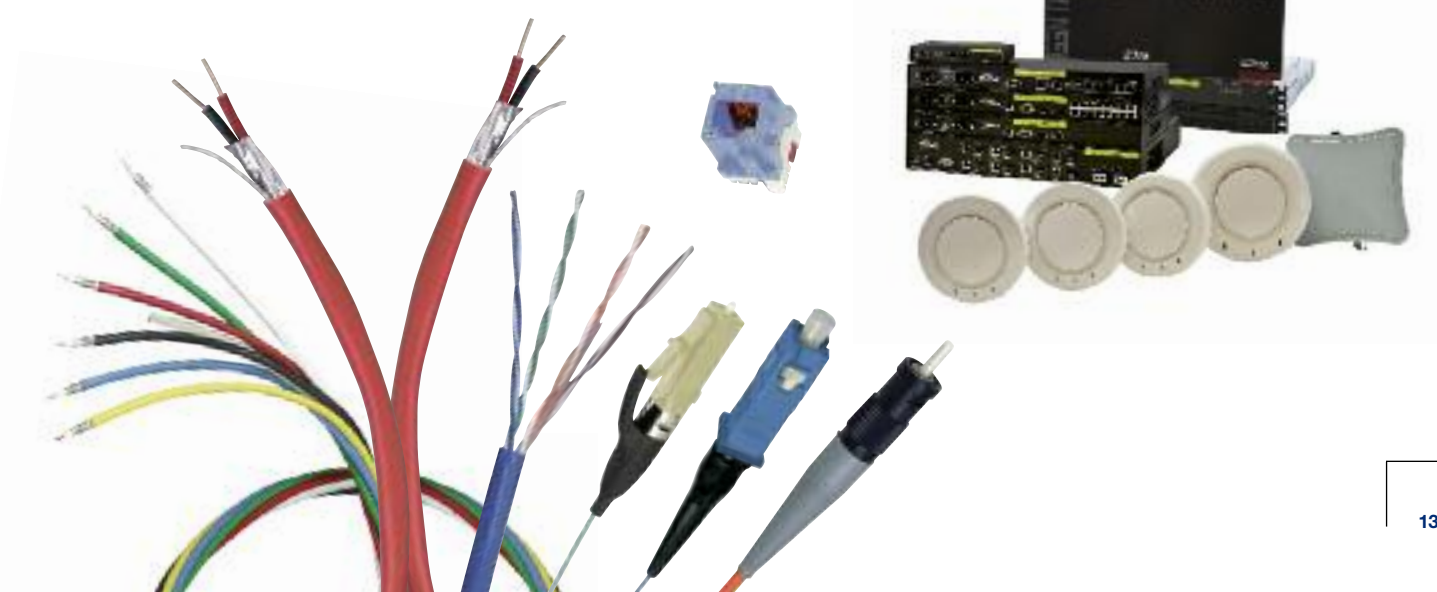
A patented design that bonds the individual insulated conductors of each pair along the full length of the cable to deliver the same electrical performance both before and after the rigors of the cable's installation. This bonded construction delivers Installable Performance®.

**Banana Peel Composite Design**

An entirely new concept in composite cable design and construction. This patented, award-winning technology offers easier installation by affixing the individual cables to a central spline for easy pulling of all the cables in a single pull. The jacketless design also simplifies termination. Installers need only Pull, Peel and Terminate – it's as simple as that.



Installed and manipulated nonbonded-pairs (left) have a tendency to gap, varying the centricity of the two conductors. Belden Bonded-Pairs (right) do not gap so the physical integrity of the pair is maintained.



Belden is fully committed to supporting the unique needs of the customer and delivering peace of mind.

## Expert Service and Support

### Expert Service and Support

Belden knows the importance of eliminating risk and uncertainty when evaluating and deploying myriad technologies that are constantly evolving. You need to be confident that you are receiving the best performing products, as well as the right infrastructure design and guaranteed performance for your unique applications. That's why we offer a total quality approach that goes well beyond product development to include the delivery, deployment and performance of our Total Enterprise Networks within every unique installation environment.

### The Best Design and Installation Partners

To design systems, deploy solutions, and maintain customer satisfaction, Belden recruits and qualifies only the best design and installation wireless partners in each industry segment — contractors with proven business histories and extensive experience in the markets they serve and the technologies they support. Belden invests heavily in evaluating, training and qualifying our partners so they have the knowledge and expertise necessary to ensure that the design and installation of a Belden solution is optimized for every unique need and environment. This ensures that you not only receive the value of Belden's superior quality products and systems, but also the added-value of factory-trained professional contractors who are experts in the design, installation and on-going maintenance of Belden Total Enterprise Networks.

### Networking CSVs

Belden's authorized Certified System Vendors (CSVs) design, install, and maintain our industry-leading copper and fiber structured cabling solutions across all Enterprise applications including

the data center and LAN. Belden only partners with leading networking contractors who meet our stringent qualification and selection criteria. Through rigorous training and evaluation, we ensure that all CSVs have the ability to design and deploy our solutions to achieve the best performance possible for every customer application. Only Belden has your networking transmission needs covered to this extent — industry-leading products and solutions that are stocked and supported through national and international distribution networks and designed, installed and maintained by the best authorized contractor network in the industry.

### Wireless ATIs

Belden's Authorized Trapeze Installers (ATIs) understand how to overcome the challenges of implementing scalable Enterprise wireless networks by designing and installing Belden's Trapeze Network Wireless Solutions to ensure that you achieve the security, mobility and seamless integration you are looking for with your wired and wireless network infrastructures. From the initial site survey and best pre- and post-deployment planning and management to configuring systems to meet your unique coverage, capacity, security, and quality of service requirements, Belden's ATIs know the ins and outs of customer-optimized wireless network design, implementation and support.

### Audio/Visual Installers

Belden's Audio and Video System Installers have the experience and know-how to design and install Belden A/V products and systems to transmit quality sound and video for today's Enterprise facilities. Many of these installers are the same professionals recognized for their expertise in deploying A/V systems for major network and cable broadcasters, film studios and corporate broadcasting stations.







### **Belden's Total Quality Approach; Our Commitment to Excellence**

Belden products and systems are backed by what are arguably the best warranty programs offered in the industry today. We understand that you expect to have your infrastructure investments protected by comprehensive, long-term warranties that parallel the expected operational lifespan of the asset. That is why we offer a series of different warranty programs to best suit the needs and expectations of our end-customers. We also believe that the *ultimate* warranty program is one that you will never need to use.

How do we stand behind that concept? We view each customer's installation as an exercise in total quality management, Belden's philosophy is that our responsibilities and obligations for quality don't stop at the end of our production lines, but extend through to each customer's actual installation. We achieve this by:

- Taking an end-to-end approach for all Belden solutions; engineering and manufacturing all components in each Belden System whenever possible to ensure complete compatibility and maximum performance.

- Ensuring that all Belden components within each Belden System are conceived, designed and manufactured to work together, from the drawing board to the customer's installation site.
- Documenting all aspects of our products' specifications and System installation requirements.
- Creating comprehensive training courses explaining the proper application, installation and maintenance of the products and Systems for the benefit of our end-customers, installation contractors, distributors and consultants.
- Recruiting and training the industry's best installation contractors who add their extensive experience and expertise to ensure that our Systems are designed and installed to best meet each customer's unique requirements.
- Providing expert Belden technical support resources to assist our customers, contractors and consultants with both their pre- and post-installation support needs.
- By offering special programs where end-customer installations that meet stringent Belden design and installation guidelines and acceptance testing requirements may be registered with Belden under special Belden System Verification programs, complete with long-term warranty support.

The Total Quality Management Approach at Belden means that each Belden product set and System is supported by processes that are designed to ensure a problem-free, optimized installation at each customer's site, fully supported by the industry's most favorable long-term warranty programs.

For example, our Belden IBDN Certified System Program for our networking systems and solutions provides two powerful warranty vehicles; one covering the quality of the individual IBDN components for 25 years, and the second guaranteeing the end-to-end performance of the IBDN System for the entire installed lifetime of the network.

Similarly, Belden A/V solutions registered with Belden are guaranteed to meet published performance specifications and provide problem-free component operation for a period of 10 years after installation.

For Belden Trapeze Networks Wireless end-customers, Belden offers a comprehensive initial hardware warranty. A corresponding software support program provides free software upgrades and phone, online and email support during the warranty period. Many customers opt for the extended warranty and support programs which range from software-only support to advanced hardware replacement.

### **Only From Belden**

**When considering infrastructure systems to support your critical Enterprise applications, Belden is ready to provide proven integrated solutions that offer superior performance and reliability combined with lowest cost-of-ownership; installed at your site under Belden's total quality approach – fully supported by the best warranty program that you will likely never need to use.**

**No other company offers such a high quality product line – backed by the industry's strongest support organization, quality and warranty programs.**

Call **1.800.BELDEN.1** or visit our web site at **[www.belden.com/enterprise](http://www.belden.com/enterprise)** for more information on Belden Total Enterprise Networks.

## GLOBAL LOCATIONS

**Customer Service:**  
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See [www.belden.com](http://www.belden.com) for a complete listing of Belden locations.



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