

## Total Enterprise Networks™ Solutions for Healthcare

**Ensuring Reliable  
Performance of Your  
Patient Care Applications  
and Systems**



Only a properly designed infrastructure can effectively support your patient care applications and systems.

## Convergence: The Path to Maximizing Investments in Medical Technology Systems While Enhancing Patient Care

### Healthcare Facilities Face Tough Challenges

Hospitals and other healthcare facilities are increasingly challenged to provide a timely and accurate flow of information between applications and systems. This includes discrete medical applications and systems such as EMR, Nurse Call, Patient Entertainment, RTLS (Real Time Location-based Systems) and location-based content delivery for patient information at the bedside and elsewhere. Each application simplifies the work flow process and enhances the ability of healthcare practitioners to provide superior patient care.

Vital medical equipment and technology systems already place huge demands on the communication infrastructures within healthcare facilities today, a condition likely to worsen as more applications are added in the future. As a result, the demand placed on these infrastructures could adversely affect or cripple the day-to-day performance of healthcare operations.

Traditionally, most medical technology systems had their own dedicated communication infrastructure. This proved to be a simple way to manage multiple medical systems and achieve system accountability. However, the technology model for healthcare communications today and in the future demands that information be shared across systems. In addition, accessibility of data must be mobile – accessible anywhere in the facility, not just at the workstation. Therefore, each traditional communication infrastructure must be “bridged” to other dedicated infrastructures in order to facilitate the desired flow of information, with data being pushed and pulled between systems and their respective dedicated databases. These bridges create additional points of failure that often negatively impact a caregiver’s access to critical data with respect to speed, reliability and content.

### The Infrastructure Convergence Solution

To ensure the continued and reliable use of multiple patient care applications and medical systems, Belden® recommends converging the infrastructures upon which these systems operate. As the foundation for all communications, a converged infrastructure ties all healthcare applications and systems together along one or more infrastructures. It provides the bandwidth and signal performance required by all of the systems and applications used in healthcare facilities today, and is scalable to meet tomorrow’s requirements.

Convergence will:

- Allow you to implement new patient care or facility management applications simply and easily
- Optimize the flow of information between the facility’s equipment and systems
- Meet the information requirements of highly mobile clinicians and caregivers
- Mitigate duplication among existing communication infrastructures
- Lower your overall cost of operation
- Simplify command and control via an open network, non-proprietary protocol

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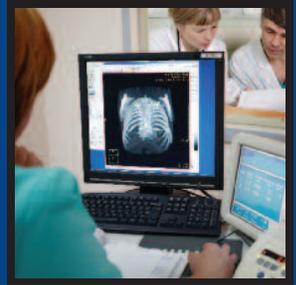
The wiring plant is arguably the most important part of the network.

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– Gartner Inc.

By following industry standards, infrastructure obsolescence and the adoption of dead-end technologies are reduced or avoided altogether. Simplicity and efficiency become the hallmarks of the new, more sustainable infrastructure.

Converging technology systems by beginning with a common communication infrastructure has become a “best practice” followed by other industries. Educational institutions, government facilities and other enterprise operations have recognized the importance and logic in converging the base infrastructure first.



### Your Roadmap to Healthcare Convergence: Belden Total Enterprise Networks

Belden Total Enterprise Networks (TENS) provides a smooth and seamless transition to a converged infrastructure – no matter where you are, or want to be, on the convergence spectrum. As a communications enabler, a converged TENS infrastructure will reliably support efficient deployment of medical technology systems that support patient care applications.

Belden provides all of the cabling, connectivity and other networking products that comprise the infrastructure. Belden also develops key medical applications and systems for:

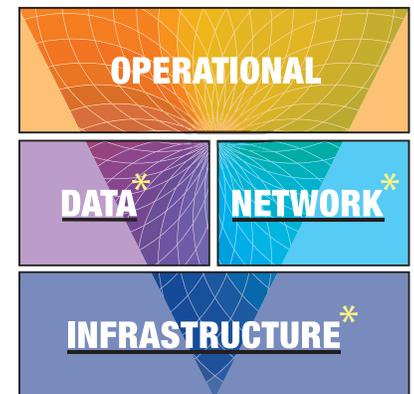
- RTLS
- Patient tracking
- Asset management and tracking
- Condition monitoring
- Location-based content delivery

Cost-effective and practical, Belden TENS professionals can provide your organization with a clear roadmap to follow – whether you are designing a totally new healthcare facility, fully modernizing your existing one, or simply looking to add specific applications or systems to your patient care service portfolio. TENS is supported by a network of partners offering a wide range of consultation, system design, local product availability and installation services backed by the best long-term warranty programs in the industry.

Hospitals can pay for Wi-Fi location services in about nine months and the entire wireless network in three years, with a few simple location-aware applications, i.e., finding clinical staff and hospital assets such as wheelchairs, IV pumps, respirators and ECG machines.

– Frost & Sullivan

### Four Types of Healthcare Convergence



\* Belden Provides Solutions Here

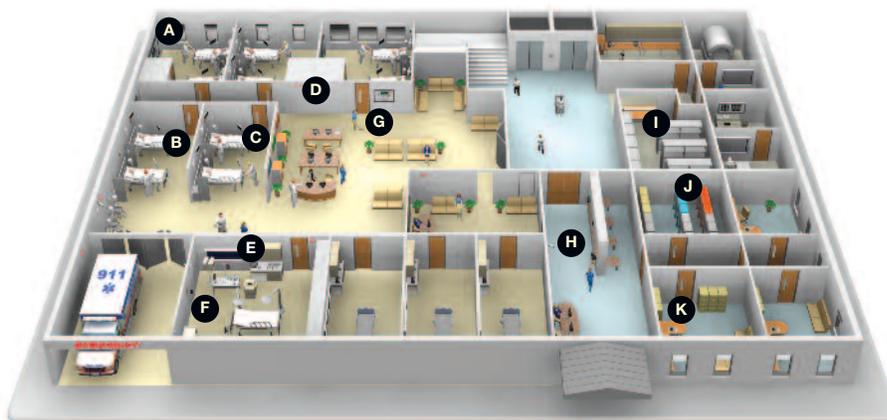
**Operational Convergence**, in which the integration of multiple systems data will yield a synergistic data flow, enabling optimum staff cooperation and collaboration and an improved patient care experience.

**Data Convergence**, in which common data formats reside on a centralized network, enabling timely, efficient sharing between applications. The goal of data convergence is to get the right information to the right people – when, where and how they need it.

**Network Convergence**, in which leveraging a common network and switches allows the coexistence and efficient utilization of telephone, video and data communications. This enables not only typical enterprise voice/data systems, but also specialized systems such as nurse call, security, paging and tracking.

**Infrastructure Convergence**, in which there is a common communication infrastructure that is shared, impacting both wired and wireless systems. Also called Pathway Convergence. This creates synergy among the various flows of information between medical equipment, systems and their related applications through the use of a shared infrastructure. It also provides a reliable foundation for communications, enabling the delivery of critical information without interruption.

### Typical Floor Topology for a Healthcare Facility



- |  |  |  |   |
|--|--|--|---|
| <b>A</b> Patient Entertainment Systems | <b>D</b> Fire & Safety Systems                             | <b>G</b> Medical-grade 802.11 WLAN Systems Supporting Wireless Devices | <b>J</b> Cable Management Racks, Environmentally Controlled Enclosures for Hospital Data Center |
| <b>B</b> Patient Monitoring Systems    | <b>E</b> Picture Archiving & Communications Systems (PACS) | <b>H</b> CCTV System for Security                                      | <b>K</b> CIS / HIS  |
| <b>C</b> Nurse Call Systems            | <b>F</b> Surgical Suite Audio Systems                      | <b>I</b> Medical-grade RTLS Systems & Applications                     |   |

With a unique ability to bridge three levels of healthcare communications – infrastructure, systems and applications – Belden is well qualified to work with you on your path to convergence.

## Ultimate Confidence for Reliable Communications

Belden operates in three levels of healthcare communications: Infrastructure, Systems and Applications. As a result of this experience and technology expertise, Belden understands the information flow, transmission technologies, obstacles and efficiencies involved in converging communication infrastructures. With a unique ability to bridge three levels of healthcare communications, Belden is well qualified to work with you on your path to convergence.

A leader in signal transmission technology, Belden is the only provider of both healthcare applications and systems *and* high reliability wired and wireless infrastructure components. Utilizing all media – copper cabling, fiber optics and wireless – you can trust that a Belden solution will be the right one for your needs.

### An Extensive Healthcare Portfolio

Belden is a strong and constant presence in the healthcare communications industry. To date, there are over 2,000 Belden Certified healthcare facilities throughout North America using Belden products in their communication infrastructure.

Belden designs, engineers and manufactures its products, applications and systems to the highest standards of excellence, not only meeting but exceeding all established industry standards for performance and reliability. This includes:

- **Newbury Networks:** medical-grade RTLS systems and applications
- **Trapeze Networks®:** medical-grade wireless mobility™ delivering 99.999% session-level reliability
- **Belden IBDN®** copper and **FiberExpress®** optical fiber cabling and connectivity
- **Audio/video cabling:** analog and digital
- **Building management cabling:** climate control, lighting, elevators/escalators
- **Security cabling:** surveillance, access control, alarms
- **Industrial-grade cabling:** for harsh healthcare environments
- **Cable and network equipment administration:** racks, cabinets, thermal and power management equipment

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Efficiencies such as the consolidation of the basic cable and pathway infrastructure – along with similar efficiencies in other trades – may save developers as much as \$2 per square foot. [Example: \$400,000 savings for a 200,000 sq. ft. complex]

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– Buildings Magazine

### Belden: The Partner You Can Trust

For more than a century, Belden has been at the forefront of signal transmission technology and product innovation. Belden's experience as an Enterprise Networking Partner is deep and proven. In addition to healthcare, Belden's customer base spans virtually all industry sectors – from financial institutions, manufacturing, high tech and corporate enterprises, to government agencies and large academic institutions.

As a multi-billion dollar corporation, with more than 250,000 products and 600 current patents, Belden offers the resources, financial stability, technical support and end-to-end solutions that mission-critical healthcare organizations need and deserve in an enterprise solution partner.

To help you identify your convergence opportunities, call 1.800.BELDEN.1 (1.800.235.3361) for your local Belden sales representative.

For more information about TENs solutions for healthcare, visit Belden's website at [www.belden.com/healthcare](http://www.belden.com/healthcare)