CCTV Systems and More

Using technology to attract and protect today's train travellers

The on-train network philosophy is changing. Passengers now want internet access and a variety of other wireless services for their comfort and convenience. Terrorism threats have increased the need for video surveillance or closed-circuit television (CCTV) systems to provide greater security. And the demand for more speed and higher efficiency is bringing automated management systems to the forefront for those who operate railway rolling stock.

All this is driving toward the whole train running on one integrated network, with enough bandwidth to support the full scope of these services. This concept is at the core of a new series of standards from the International Electrotechnical Commission (IEC) to improve modern railway travel.

Two standards, in particular, stand out. First, IEC EN 61375 Train Communication Network covers the architecture of data communication systems in open trains. Second, IEC EN 62580 On-Board Multimedia and Telematic Subsystems for Railways specifies the general architecture of such systems as CCTV, driver and crew oriented services, passenger oriented services, and train operator and maintainer oriented services.
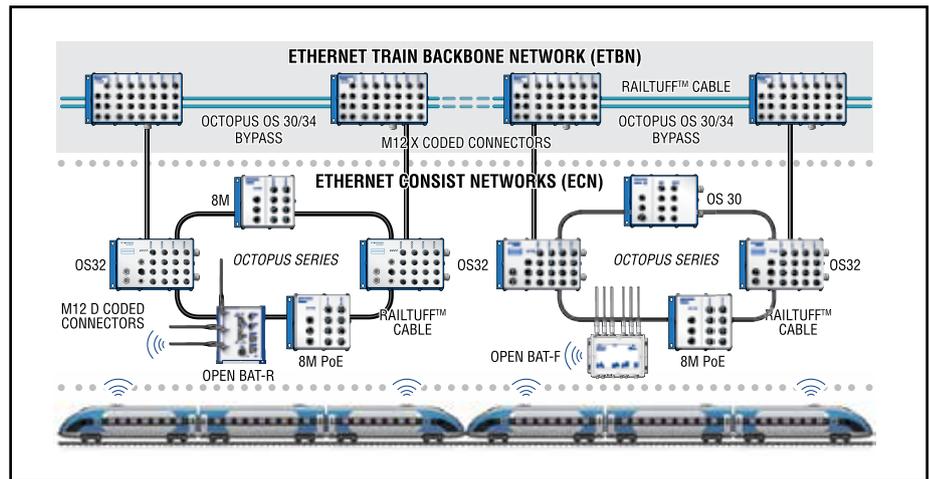
Belden Can Help

To meet these standards, transportation network designers must take a holistic approach. Belden makes it easy. Our experts are serving in IEC working groups helping formulate these industry-wide, on-board standards. Plus, the Belden product portfolio integrates all the network elements you need:

- Switches
- Routers
- Connectors
- Cables

With both wired and wireless options, you'll find what you need for a complete, customized network solution.

Making the Wireless Connection

Creating a whole-train integrated network will require the use of wireless local area network (WLAN) technology. While critical to success, WLANs also present some challenges. Interference ranks at the top of the list of concerns.

Increasing bandwidth for on-board multimedia and telematic applications is made possible with a complete Ethernet network from Belden.

The new Hirschmann OCTOPUS 30/34 switch features four Gigabit Ethernet (GE) ports (available in copper or fiber), L3 routing functionalities and Power over Ethernet (PoE) support for maximum network availability. It also includes the latest by-pass relay feature as specified in IEC EN 61375 for reliable networking.

To meet this challenge, Belden offers OpenBAT platform modules with integrated band-pass filters to markedly reduce noise levels and prevent packet losses. This makes possible data speeds up to 50% higher than previous device generations.

In addition, OpenBAT products have standardized Parallel Redundancy Protocol (PRP) built in. PRP dramatically improves reliability and the quality of wireless connection services. Loss- and latency-sensitive applications from train to ground can be implemented successfully because PRP protects the network topologies of both wired and wireless connections more effectively.

Exceeding Industry Standards

Belden's RailTuff™ range of Ethernet cables supports data ranges up to 10 Gbps and meets or exceeds all of the requirements for on-board use. The entire cable range is halogen free, flame- and oil-resistant and has an operating temperature up to 90°C, exceeding the 85°C requirement with Class TX of IEC EN 50155. The highly stranded copper conductor

gives superior bend radii performance. In combination with braid and Beldfoil™ shielding, you get superior strength and an improved EMI performance.

For connectivity, 360 degree shielded M12 D coded and X coded connectors not only fulfill all the international standards for railway applications but also come with a high fire protection rating. They are available in field-terminated versions or supplied along with the RailTuff cable as pre-terminated patch cables.

With the on-board network design moving from multiple individual bus systems supporting specific data networks to a single integrated Ethernet network, Belden is uniquely placed to be the supplier of choice to the rail industry. With a complete portfolio of IEC compliant Ethernet system elements, Belden will help create an integrated network that fully supports the increasingly sophisticated array of services the market demands.

Learn more about Belden's rail-friendly portfolio at
www.beldensolutions.com/transportation

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