Belden Industrial Infrastructure Solutions

End-to-end portfolio of ruggedized hardware/ software solutions for demanding industrial environments

BELDEN
SENDING ALL THE RIGHT SIGNALS

GarrettCom®
A **BELDEN** BRAND

HIRSCHMANN
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lumbergautomation
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TOFINO SECURITY
A **BELDEN** BRAND

tripwire®

Be certain.
Belden.

Because Uptime Matters to You

From simple cable runs to complex, integrated communication networks, you need a vendor who goes beyond offering just good products. You need a partner who brings you the total package:

- Premium quality industrial products with unmatched warranties

- Custom design options for both products and network topologies

- Proven industry experience and expertise—more than 115 years in business

- Cutting-edge, comprehensive security solutions based on 20+ years of cyber security experience

- Expert troubleshooting and technical support

- Training opportunities to stay on top of quickly changing technologies

With Belden, you can be certain. You'll find exactly what you need to design, build, manage and protect your industrial infrastructure.

Expertise Across the Industrial Spectrum

No matter whether you are producing things, processing raw materials, moving people and cargo or generating energy, Belden understands. You'll find expertise – and proven solutions – in a variety of industrial settings.

- Discrete Automation (automotive, food & beverage, intralogistics, packaging)

- Process Automation (water/wastewater, oil & gas, mining, petrochemicals)

- Transportation (intelligent traffic systems, rail transport, mass transit)

- Energy (electrical substations, power grids, wind power, solar power)

Explore the Industry's Broadest Portfolio

INDUSTRIAL CABLE
www.belden.com/products/industrial/cable

Industrial Ethernet Cable

Diversity for any need: Cat 5e, Cat 6, Cat 6A

- Superior reliability
- Long-term performance from Belden's patented bonded-pair design
- 100% shield coverage for improved protection over a wide frequency range

VFD Cable

Output cables for variable frequency AC motor drives

- Superior protection against electrical noise
- 100% and 300% ground options
- Full compliance with NFPA 79 guidelines

Flex Cable

For control, power or data applications with a small bend radius and high flex life

- Reduces total cost of ownership through reduced maintenance
- Superior performance for motion applications, including NFPA 79
- Eliminates common failure modes: cable fatigue, torque, cable memory

SpaceMaker Cable

Low-voltage electronic cables for control, instrumentation, power

- Reduced size – up to 52% reduced cable area
- Increased flexibility – up to 74% tighter bend radius
- Suitable for NFPA 79 applications

TC & TC-ER Instrumentation Cable

Superior electrical performance and longer runs in dozens of different environments

- Rated for exposed runs — no need for conduit
- Assured, flexible installation connections with all the necessary ratings

INDUSTRIAL CONNECTIVITY
www.belden.com/products/industrial/connectivity

Power Connectors

Broad, practical selection ranging from design diversity to specific standards and high-voltage versions

- 7/8",1" & 1-1/8" MINI
- 7/8" & 1-3/8" MINI Power
- M12 Power
- M23 Series
- G/GO/CA/ST Series

Valve Connectors

For hydraulic, pneumatic and electro-magnetic applications that demand high protection against dust, water and vibrations

- Type A
- Type B
- Type C

I/O Systems

Great diversity – from passive distribution boxes, fieldbus and modular I/O systems to high-performance multi-protocol modules

- Distributed Control Units
- Ethernet I/O Modules
- IO-Link Masters & Devices
- Passive Distribution Boxes
- Fieldbus Systems
- Modular I/O Systems

Data Connectors

Robustly designed cordsets with high mechanical and chemical resistance capability

- EtherNet/IP
- PROFINET
- EtherCAT
- DeviceNet
- PROFIBUS

Sensor/Actuator Cordsets & Connectors

Industry's smallest, lightest cordsets – Pico (M8) and Micro (M12)

- EtherCAT
- DeviceNet
- PROFIBUS

INDUSTRIAL NETWORKING
www.belden.com/products/industrial/networking

Unmanaged Switches

SPIDER Switches

- DIN Rail Fast/Gigabit Ethernet switches—more than 25 variants to meet your specific needs
- Standard and Premium line variations for transmitting large amounts of data across any distance
- Power over Ethernet (PoE) Injector for powering networked terminal devices
- Plug & Play -- no need for additional documentation, standard procedures or operator training

RS20/30 Switches

- Reliability – models available for environments ranging from -40ºC to +70ºC and designed to tolerate harsh industrial or outdoor environments
- Flexibility – available in standard configurations ranging from 4 to 26 ports, with both 10/100 copper and 100Mb fiber ports, with optional Gigabit ports – both multi- and single-mode fiber port options available + optional PoE ports
- Plug & Play – no need for additional documentation, standard procedures, or operator training

Magnum ES42 Switches

- Port Flexibility – offers 6 switch ports, 1 or 2 of which may be 100 Mb fiber, others are 10/100 copper
- Hardened – models available for both industrial (factory floor) and outdoor (temperature-uncontrolled environments)
- Power Flexibility – available with 12, 24, -48V DC as well as AC Power
- Link-Loss-Learn (LLL) –for use in self-healing LAN structures.

Managed Switches

DRAGON MACH4x00
Layer 3 Backbone Switches

- Enables easy, progressive transition from 1 GE to 2.5 GE to 10 GE speeds
- Helps you build a redundant backbone network for maximum availability
- Offers redundant and hot-swappable power supply for maximum device uptime

GECKO Switches (4TX, 5,TX)

- Cost-effective way of entering the world of managed switches
- Centralized configuration of network parameters from a web interface
- Redundancy and diagnostic functions ensure high network availability
- Easy commissioning (compared to fully managed switches)

OCTOPUS IP65/IP67 Switches

- Waterproof and dust-tight switches & routers for fail-safe operation in any harsh environment
- Meet application-specific regulations, including EN 50155, EN 50121-4 & EN 45545 for rail transportation
- Versions with Power over Ethernet (PoE) and Gigabit speeds

Modular Rail Switches
(MS20/30, MSP30/40)

- Flexible, economical and future-safe
- Modular constructions enable network growth over time
- Especially useful in highly complex networks that require high port density

RSP Series Switches

- Built-in PRP and HSR based on international IEC 62439 standard for future-proof interoperability
- Uninterrupted data communication ensuring continuous access to machines & systems
- Comprehensive security functions for all-around protection against network attacks
- Rigorous real-time requirements thanks to precise time synchronization in accordance with IEEE 1588 v2

Routers & WAN

Magnum DX940e Router

- Obtain better connectivity with high speed 4G/LTE cellular interface for secure remote access

- Use high-end, robust cybersecurity mechanisms with advanced safety features, IP routing and guaranteed network protection with firewall layers

- Adhere to industry standards with NERC CIP compliant security elements

Magnum 10RX Router

- Multi-Protocol Support – enables protocol routing for legacy networks, as well as current IP routing technologies

- Cyber Security Capabilities – includes built-in firewall protection & virtual private network (VPN) security

- Reduce Network Downtime – replace failed power supplies in the field on a live network, while system continues operating on secondary power unit

Magnum 5RX Router

- Migration path bridges legacy interfaces with new IP-based technologies

- Advanced software features offer Layer 3, advanced routing capability along with best-in-class firewall protection & VPN security

- Complete, integrated core-to-edge network solution when combined with Magnum 10RX Security Routers & Switches

BAT450-F Wireless LAN Access Points

- Customizable configurations including port type & quantity

- Ruggedized, compact design meets IP65/67 protection class, with extended temperature range of -40°C to +70°C

- Runs on Hirschmann's HiLCOS software to ensure maximum network availability & data security

BAT867-R Industrial Wireless Access Points

- Fast data speeds enable transmissions up to 867 Mbps with IEEE 802.11ac radio module & backward compatible to a/b/g/n standards

- Industrial design helps you comply with challenging governance requirements for withstanding signal interference, vibrations, EMC

- Cost-effective solution with only the features required by typical industrial WLAN applications – one radio, one Ethernet port, one power supply + can be used as access point, client, router or bridge

- Reliable wireless connectivity even when monitoring and operating machines from wireless tablets or smartphones

Wireless LAN Controller

- Centralized management of wireless network components for secure operation

- Easily scalable for legacy devices and future growth

- Compliant with IEE 802.1x, RADIUS and LEPS standards

- Guarantees high availability through redundancy and backup mechanisms

![Belden logo — SENDING ALL THE RIGHT SIGNALS]

Media Converters

Magnum CS14 Converter

- Provides one 10 Mb fiber port and two 10/100 copper switch ports
- Two RJ45 ports support IEEE 802.3u for attaching any 10 Mb or 100 Mb device
- Integral terminal blocks for 12V, 24V, 48V DC power input; external AC power supply optional
- Either DIN-Rail or Tray-Mountable

Magnum CSG14 Gigabit Converter Switches

- Provides one Gb fiber port and two 10/100/1000 copper switch ports
- Two RJ45 ports are triple-speed auto-negotiating to enable attaching any 10 Mb or 100 Mb or 1000 Mb (Gb) device; both multi-mode and single mode Gb Fiber ports available
- Integral terminal blocks for 12V, 24V, 48V DC power input; external AC power supply optional.
- Either DIN-Rail or Tray-Mountable

Magnum CSN14 Converter

- Provides one 10 Mb fiber port & two 10/100 copper switch ports
- Two RJ45 ports support IEEE 802.3u for attaching any 10 Mb or 100 Mb device
- Integral terminal blocks for 12V, 24V, 48V DC power input; external AC power supply optional
- Either DIN-Rail or Tray-Mountable

Magnum CSG14U Gigabit Converter Switch

- Provides two SFP open transceiver fiber switch ports & one 10/100/1000 copper switch port
- Each SFP port accepts either Gb or 100Mb fiber SFP transceivers
- Hardened for factory floor or premium-rated for -40°C to +85°C outdoor
- Integral terminal blocks for 12V, 24V, 48V DC power input; external AC power supply optional
- Either DIN-Rail or Tray-Mountable

Additional Networking Tools

Industrial HiVision Network Management Software

- Obtain instant visibility of key performance indicators with the Network Dashboard
- Find faults quickly & achieve timely remediation
- Easily identify, map & configure all network infrastructure, including SNMP-enabled devices from any manufacturer – even during live operation
- Download free version of the software for unlimited use before you buy

Secure Remote Access

- Easy to implement, allowing those with limited technical knowledge to network devices together
- State-of-the-art security technology results in a secure system without reconfiguring corporate firewalls
- Immediate remote access & control of industrial networks to fix problems means more efficient, productive staff time & less network downtime

MIPP (Modular Industrial Patch Panel)

- Maximum flexibility – combine up to 6 modules to create a single panel for both fiber & copper cables
- Quick, easy installation with greater efficiency & less maintenance
- Compact design for maximum use of space

CYBER SECURITY

www.belden.com/solutions/industrial/cyber-security

Security Devices

EAGLE One Router

- Compliance with global standards and certifications, including the United States Occupational Safety & Health Administration's Class I, Division 2 hazardous location conditions, Europe's ATEX directives and the Germanischer Lloyd classifications.

- Ease of integration through unique "firewall learning mode" that reduces traditional installation risks

- Advanced redundancy features for maximum security, including layer 2 & layer 3 functions that ensure switchover to a standby device in the event of a fault or failure

EAGLE20/30 Firewalls

- Customizable design with interface configuration options for Fast Ethernet, Gigabit Ethernet & Symmetrical High-speed Digital Subscriber Line (SHDSL)

- Advanced Graphical User Interface helps you create custom rules for fast, easy configuration

- Operating system HiSecOS 3.0 security features, including Deep Packet Inspection (DPI), ensure the highest level of security

Tofino Xenon Security Appliance

- Protect PLCs, RTUs and other control devices with this stealth industrial firewall that provides stateful and industrial protocol deep packet inspection at Layer 2 (data link)

- Simplify installation: Zero-impact Plug-n-Protect technology requires no pre-configuration, no network changes and no disruption to the control system

- Configure-Test-Deploy: Zero-day vulnerability protection with deep protocol awareness that is not dependent upon vulnerability updates

Rail Data Diode

- Reliably protects networks from external cyber threats through singular data flow

- Securely transfers Ethernet data to the public internet without putting the system at risk

- Easy-to-explain product functionality for governmental or regulatory approval processes

Software & Support

Tripwire Industrial Visibility (TIV)

- Completely passive solution that dissects industrial network traffic to perform industrial asset discovery, profile all industrial protocol communication, and provide threat detection from the DMZ down to the field I/O devices

- Understands over 40+ industrial protocols including EtherNet/IP, ModBus, DNP3, S7, PROFINET, IEC 101/104, GOOSE, and Bacnet

- Provides visibility into controller mode changes, configuration changes, and firmware uploads

- Diagrams network communication traffic patterns via Purdue model

Tripwire Enterprise (TE) Security Configuration Management Suite

- Featuring the Tripwire Data Collector, think of it like a "Security SCADA" that provides full network visibility & understands common Industrial protocols such as Modbus TCP and EtherNet/IP

- Agentless monitoring requires no software installation or changes

- Maximize uptime with real-time threat detection

- Gain deep visibility into your cyber security hygiene & monitor PCs, PLCs, & other network hardware for changes

Tripwire Log Center

- Think "Security Historian" with the ability to report all log data

- Purpose-built dashboard for out-of-the-box functionality with Tofino Xenon

- Log collection from a variety of sources to easily interpret & parse data for analysis and reporting

- Create your own correlation rules with simple, Visio-like interface

VALUE-ADDED BENEFITS

The Belden Solution brings breadth you won't find with any other vendor. Consider the reliability of a total infrastructure built to work seamlessly in the harshest operating conditions. Based on true industry knowledge built over time in field-proven applications, Belden networks work.

Plus, you'll find Belden professionals actively engaged in the governance organizations and work groups exploring new technologies and setting standards for optimum performance.

Below are additional reasons you can be certain with Belden.

Competence Center

As a reliable partner for end-to-end solutions, Belden offers expert consulting, design, technical support, as well as technology and product training courses, from a single source: Belden Competence Center.

Connectivity Center

As the only one of its kind in the market, the Belden Connectivity Center is your worldwide partner for implementing custom connectivity solutions for your application. From specialized connectors and cable assemblies to active and passive I/O modules for fieldbus or Ethernet networks, we quickly deliver the flexibility you need.

Learning Opportunities

www.belden.com/resources/training/industrial-training

Keep pace with the latest trends and newest technologies through Belden.

- Formal certification courses
- Local roadshows
- Bi-weekly blogs and newsletters

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