

Digital Transformation in Process Manufacturing

The Right Technologies to Achieve Greater Operational Efficiency and Production Capacity

SOLUTION BRIEF



Automation isn't new in process manufacturing—but digitization is revolutionizing how manufacturers operate.

Today, you have unprecedented opportunities to apply intelligent technology to industrial processes to replace repetitive, manual tasks with highly efficient, automated workflows. This decreases errors, increases delivery speed, boosts quality, minimizes costs and simplifies your business processes.

But to advance digitization, you need more network capacity, better connectivity, and flexibility to integrate your operational (OT) and information technology (IT) systems. At the same time, you must meet stringent safety, security, regulatory and industry mandates everywhere you do business, adding more layers of complexity to your operations.

At Belden, we understand the unique challenges of process manufacturing, including the need to leverage legacy assets while moving ahead with digital transformation. As a trusted networking and connectivity provider for decades, we supply vendor-agnostic solutions to power your next-generation process manufacturing facilities.

We can help you enhance production capability and support your ongoing digitization objectives as you prepare for the future.

Designing Future-Ready Networks for Process Manufacturing

Industry 4.0 is here—and driving rapid change across process manufacturing sectors. Many companies like yours are implementing solutions that collect and analyze more data from connected assets to propel real-time decision making and efficiency gains.

The transformative potential of Industry 4.0 is massive. McKinsey Global Institute reports that applying Industry 4.0 technologies can yield global economic impacts of \$420 billion to \$1.5 trillion through productivity improvements.

How can you better reap the rewards of Industry 4.0? Digitization involves the use of specialized solutions fine-tuned to the needs of process manufacturing.

These solutions empower you to adopt strategies that enhance operational performance and improve your bottom line.

- **Energy monitoring:** reducing hardware investments and power consumption to reduce ecological footprint.
- **OT cybersecurity:** protecting operational equipment and ensuring equipment safety, power reliability, and security compliance.
- **Sustainability and regulatory compliance:** addressing regulations on emissions reduction and moving away from or decreasing the release of toxic by-products.
- **Connected workers and machines:** connecting plants, workers and machines for dynamic process optimization.
- **Real-time quality monitoring:** monitoring of working material properties to ensure products meet specifications.
- **Batch tracing:** labeling and tracing product batches accurately, reducing recall liability and promoting process improvement.
- **Production schedule optimization:** managing production volume and timing to optimize working capital and inventory levels.
- **Predictive maintenance:** optimizing maintenance activities to increase machine life and reduce downtime.

Belden can help you deploy the right networking and connectivity solutions to achieve your objectives and accelerate your digital maturity.

We work with you to map a digitization strategy that integrates legacy systems with new technology to make data available anytime, anywhere for analysis on-premises or in the cloud.



Pathway for Digital Transformation

With Belden as your technology solutions partner, you can implement powerful networking and connectivity solutions to gain measurable key performance indicator (KPI) improvements and return on investment (ROI). Our experts provide a comprehensive network audit to understand your current operations, workflows and goals, then we recommend opportunities for enhancement.

With Belden by your side, you can focus on essential process manufacturing priorities.

Element 1:

Control Systems

Achieve complex, high-level control of plants and processes

- **Distributed control system (DCS):** controls a process or plant.
- **Process control system and network (PCNs):** control individual processes.
- **Supervisory control and data acquisition (SCADA):** includes computers, networked data, communications and graphical user interfaces for high-level supervision of machines and processes.
- **Manufacturing execution system (MES):** provides information that helps decision makers understand current conditions to improve production output.

Element 2:

Safety & Security Systems

Deliver detailed monitoring and control of hazards and threats

- **Gas monitoring and analyzing system:** identifies concentrations of known gases in an atmosphere.
- **Safety instrumented system (SIS):** takes automated action in a plant to keep the plant in a safe state when abnormal conditions arise.
- **Emergency shutdown system (ESS):** closes valves and shuts down machinery in an emergency.
- **Fire and gas system (FGS):** protects plant personnel and the environment.
- **Vibration monitoring system (VMS):** uses sensors to monitor critical machinery.

Element 3:

Ancillary Systems

Manage monitoring and control of external resources

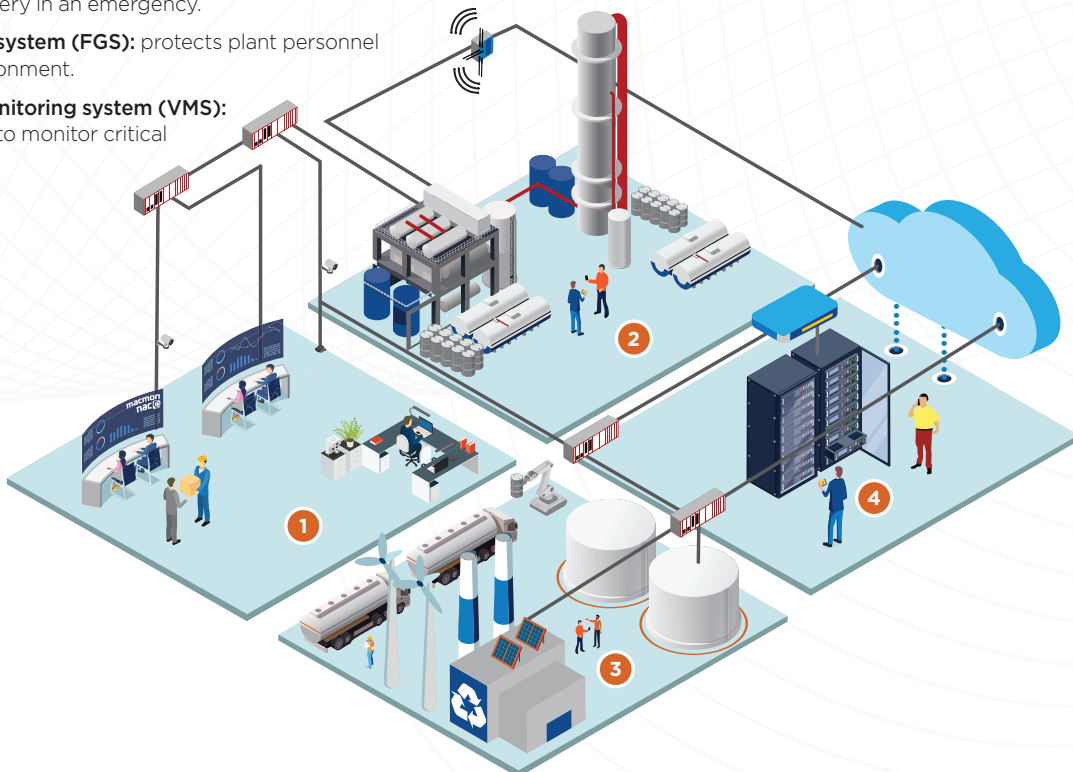
- **Power plants and substations:** support electrical power generation, transmission and distribution.
- **Product cargo and logistics terminals:** support the safe transport of resources, goods and hazardous materials.
- **Tank farms:** store liquid petroleum or petrochemical products in large containers.

Element 4:

Backbone Network

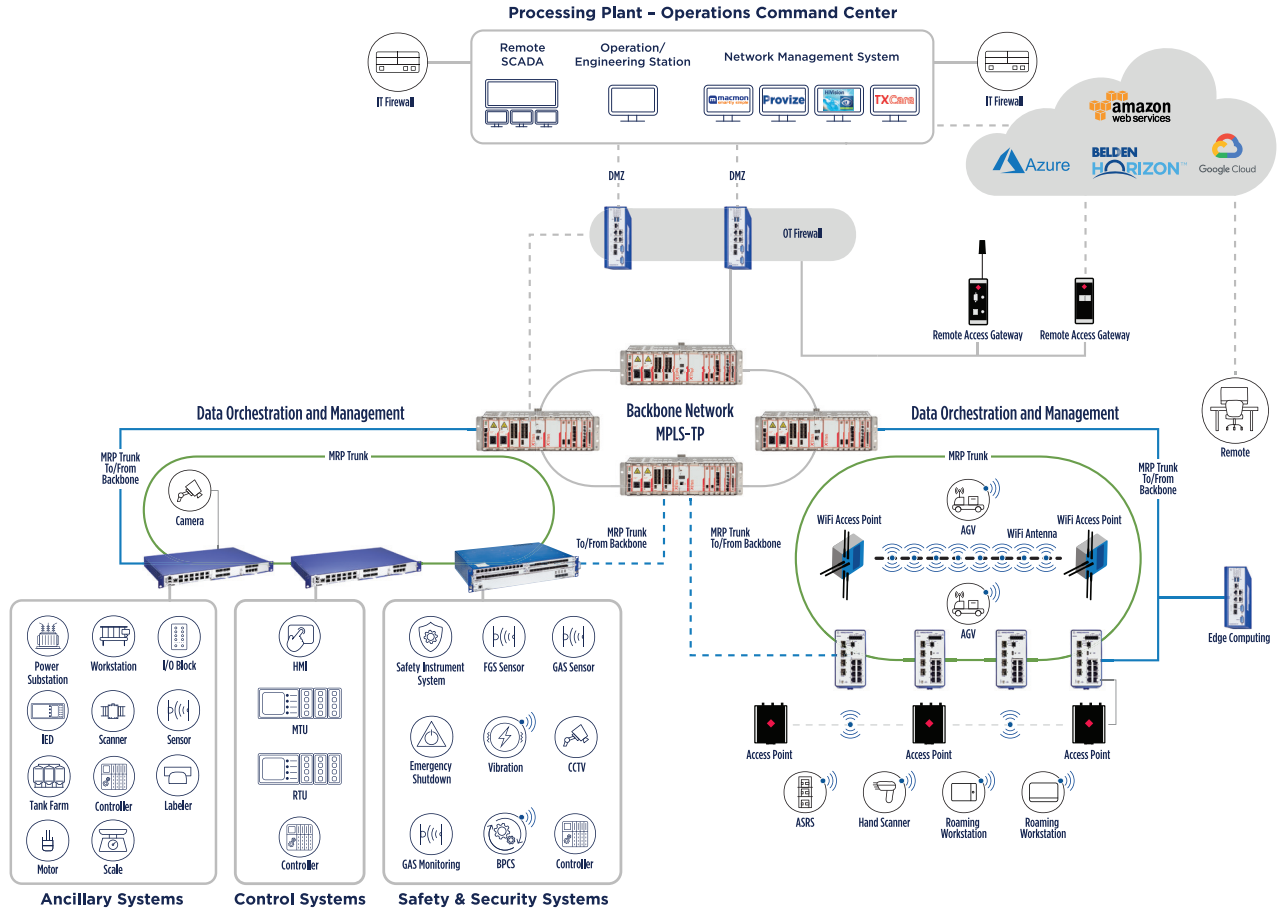
Provide powerful, reliable wired, wireless and remote connectivity plant-wide

- **Combined service network:** provides telecommunications infrastructure that covers all strategic objects.
- **Plant-wide wireless network:** provides reliable wireless control to support increased monitoring activities.
- **Network management:** discovers new devices; reports events, alarms and configuration changes; and supports network optimization.
- **Remote connectivity:** enables users to address issues and keep operations running through remote support, pushed updates and virtual maintenance.



Belden – Experts for All Your Process Manufacturing Networking Needs

As an end-to-end network solution provider, Belden guides you to the solutions you need to move forward on your digitization journey. You can rely on us to bring the right expertise, products, and partners to build seamless, efficient and secure networks for collecting data from sensors and actuators for analysis at the network edge or in the cloud.



Control Systems Safety & Security Systems | Ancillary Systems

- DataTuff, RailTuff, MarineTuff, MachFlex, Xtra-Guard industrial cables
- LioN-X active I/O modules
- ICX, PLX protocol gateways
- BRS, GRS, MSP layer 2 managed switches
- EAGLE 40 firewall

Backbone Network

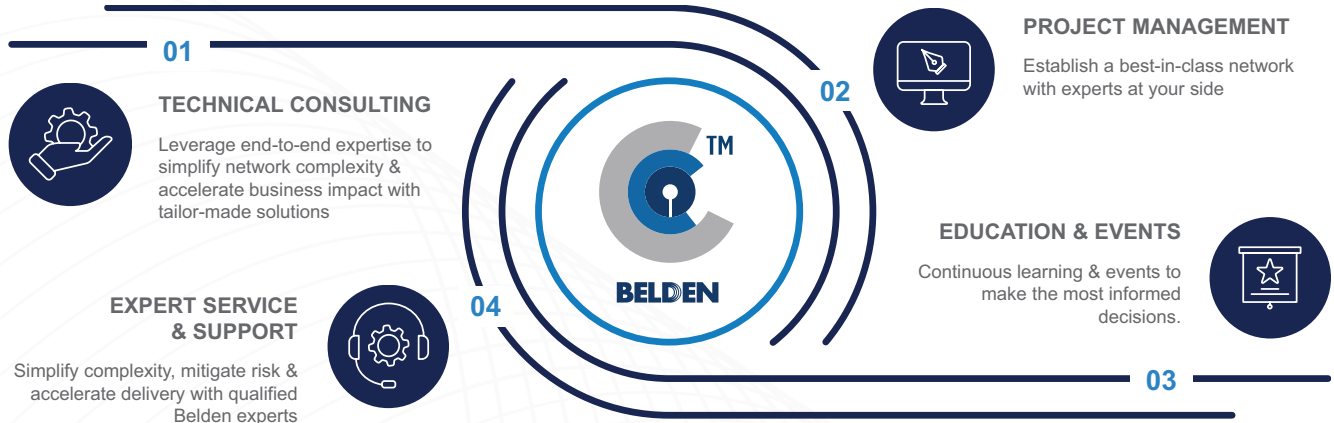
- DRAGON MACH, GREYHOUND layer 3 managed switches
- PROVIZE, HiVision, TXCare network management systems
- Belden Horizon platform
- XTran MPLS solutions
- NAC network access controller
- EAGLE 40 firewall

Discover the Entire Portfolio

Visit belden.com/process. Discover the complete process manufacturing bill of materials and customize your solution with our experts.

Global Customer Innovation Centers

Belden's Customer Innovation Centers (CICs) serve your needs throughout the solution development lifecycle. These hubs – strategically located to serve regions throughout the world – offer access to best-in-class capabilities, including the opportunity to run proof of concepts (POCs) in our validation lab.



Our Experts at Your Side

Designing the right solution for your business needs is not an easy task, so Belden provides direct access to our experts.

Solution Architect



- Deep technical knowledge of network architectures
- Develop, design, and validate best solutions tailored to the complexity of each customer unique business challenge

Digital Automation Consultant



- Industry expertise with deep networking know-how
- Lead process, workflows, and data assessments to identify digital transformation opportunities and calculate potential value of network solutions for the customer

Solution Consultant



- Deep technical knowledge of applications and industries
- Guide the customer in their digital transformation journey conducting industrial network audits and positioning the ideal solutions

Service Engineer



- Deep technical knowledge of products and technologies
- Conduct trainings, testing and commissioning networks
- Lead network assessments and deliver high quality pre-sales and post-sales technical support



About Belden

Belden Inc. delivers the infrastructure that makes the digital journey simpler, smarter and secure. We're moving beyond connectivity, from what we make to what we make possible through a performance-driven portfolio, forward-thinking expertise and purpose-built solutions. With a legacy of quality and reliability spanning 120-plus years, we have a strong foundation to continue building the future. We are headquartered in St. Louis and have manufacturing capabilities in North America, Europe, Asia, and Africa. For more information, visit us at www.belden.com; follow us on [Facebook](#), [LinkedIn](#) and [Twitter](#).

Learn More

Learn more about the connected process manufacturing solutions from Belden and contact our process experts: belden.com/process