BELDEN
SENDING ALL THE RIGHT SIGNALS

Substation Automation Solution

**Substation Hardened
Solutions from the
Global Leader in Mission-
Critical Applications**

h HIRSCHMANN
A **BELDEN** BRAND

GarrettCom®
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T TOFINO SECURITY
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**Belden offers complete, integrated
solution for reliable, cost-effective
operation of substation automation**

Proven Technology for Mission-Critical Communications

Belden is a trusted power generation, transmission & distribution partner. Its data networking solutions provide:

- High signal availability for maximum uptime

- Secure communications for trusted signal integrity

- Leading-edge, standards-based products for optimal signal performance when and where you need it

The successful modernization of substations greatly helps our customers gain many important experiences on IEC61850 substation construction. Hirschmann products are specially certified for a range of application scenarios; the switches provide cost-effective solutions and guarantee high availability communication for applications in the energy sector.

Belden Ensures Reliable Data Flow

To meet the need for a high speed, seamless data flow and the accurate monitoring and control of power flowing in and out of the grid, Belden provides field proven, leading-edge products for the EMI-stressed substation environment:

- No data loss redundancy technologies, the PRP and HSR based on IEC 62439-3
- Hirschmann™ Ethernet switches, security / firewall devices and networking software
- Hirschmann wireless LAN(WLAN) systems

- Hirschmann factory terminated fiber optic and unshielded twisted pair (UTP) media
- Belden TrayOptic® fiber optic cables and connectivity
- Belden leading edge, substation- grade industrial Ethernet products enable the convergence of SCADA, protection signaling, remote engineering access / diagnostics, metering and physical security applications at both the substation LAN and WAN.
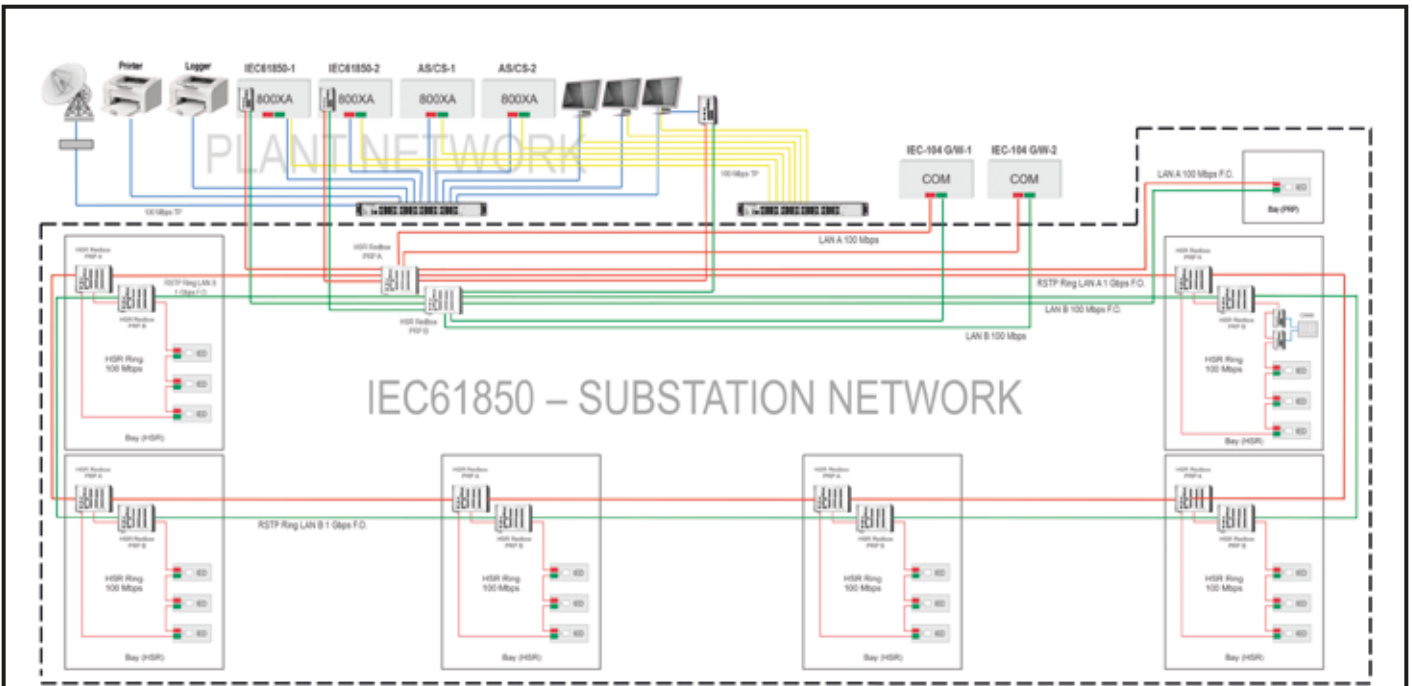
All products meet applicable industry standards:

- IEC 61850-3
- IEEE 1613 Class 2 performance (KEMA tested)
- UL, cUL and ISO / IEC 24702

Belden-Hirschmann substation hardened products are designed to meet the mission–critical needs of the power transmission and distribution industry.

Substation Network with Seamless Redundancy

Application Requirements:

- Standardized seamless redundancy protocol with zero failover time.
- Dual ring system architecture
- Future-proof designed through interchangeable media modules to keep pace with evolving network requirements

Hirschmann Solutions:

Redundancy

- Integration of intelligent electronic devices (IED's) supporting HSR protocol
- High-availability Seamless Redundancy (HSR) protocol and Parallel Redundancy Protocol (PRP)
- Integration of Process Logic Controllers (PLC's) not supporting PRP with Red Boxes
- 1 GE RSTP / MRP backbone ring forming LAN A and LAN B of the PRP network
- Parallel Redundancy Protocol with GE support based on IEC 62439-3 (RSPE 35 / 37 from HiOS6.0)
- Cutting edge redundancy mechanisms from HiOS 6.0 through FuseNet™

Real Time

- PTPv2 TC two-step on all ports, SNTP server and client, Buffered RTC (real time clock)

Security (RSPE L2A / L3S)

- Multiple Privilege Level
- DHCP Snooping, Dynamic ARP Inspection
- Automatic Denial-of-Service Prevention
- Audit Trail
- Further 802.1x enhancements (Multi-client authentication per port, MAC Authentication Bypass, RADIUS Policy Assign, Time based ACL
- Extended wired speed Ingress ACLs (MAC, IPv4) per port / VLAN

Management Software

- Network Management and monitoring through Industrial HiVision 6.0.03
- HiView, HiMobile, HiFusion and HiDiscovery

Proven Technology for Mission-Critical Communications

GRS

- 19" Rack-mount ruggedized switch
- Maximum uptime in extreme environmental conditions
- Extended temperature range: -40°C to +70°C
- Redundant power supply inputs, hot swappable on GRS 1040
- Front / Rear ports options
- Up to 28 ports
- Up to 16 PoE ports (Max 180Watt)
- Approvals: IEC 61850-3, IEEE1613, IEEE1518v2

RSPE

- Compact ruggedized din rail switch
- Redundancy, PRP, HSR, MRP, Fast MRP, Security, HiOS
- 4 Gigabit ports plus up to 24 Fast Ethernet ports
- Extended temperature range: – 40°C to + 70°
- Up to 24 PoE ports (Max 124 Watt)
- Approvals: IEC 61850-3, IEEE1613, IEEE 1518v2

RSP

- Cost-effective rugged switch
- Redundancy, PRP, HSR, MRP, Fast MRP, Security, HiOS
- 3 Gigabit ports and 8 Fast Ethernet ports
- Redundancy Box for Non PRP devices
- Extended temperature range: – 40°C to + 70°
- Redundant Power Supply
- Approvals: IEC 61850-3, IEEE1613, IEEE 1518v2

Network Management Software

- Operator edition for network supervision
- Engineering edition for device configuration
- OPC and ActiveX for SCADA integration
- SNMP support for 3rd party devices monitoring

Eagle 30
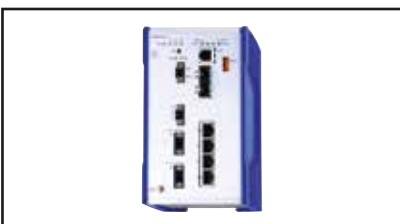
- Industrial multi ports firewall
- Extended temperature range: -40°C to +70°C
- Up to 6 ports (4 X 10 / 100BASE-TX, 2 X FE / GE slot)
- Redundant power supply inputs
- Supports IP Masquerading, 1:1 NAT, Masquerading NAT, ACL and IPsec VPN
- Supports L3 dynamic routing protocol – OSPFv2

Proven Technology for Mission-Critical Communications

Tofino Xenon

- Industrial security router
- Extended temperature range: -40°C to +70°C
- Redundant power supply inputs
- Deep packet inspection LSMs: Modbus, OPC, Ethernet / IP, IEC 104 and DNP3
- Run in test mode to check firewall rules without causing network interruptions

MIPP

- Modular industrial patch panel
- Easy to mount on DIN-Rail or beside the cabinet by use of a wall mount place
- IP20 industrial grade
- Combine copper and fiber management in single patch panel
- Modularity: combine up to 6 modules to form a single panel
- Wide temperature range: -20°C to +70°C

Industrial Cables A/I-DQ (ZN)(SR)H

- Direct burial, duct or outside devices for inside and outside use FRNC / LSNH
- Weather resistant
- Protection from mechanical and rodent damage with or without metallic armour

Datatuff Industrial Ethernet Patch Cords
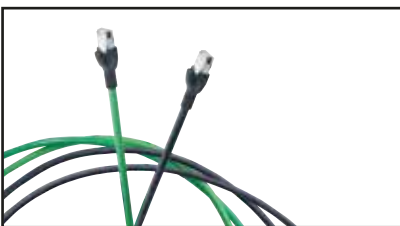
- Industrial Ethernet patch cords
- RJ 45 to RJ 45, IP20 and IP67 combinations
- Solid and stranded constructions
- Shielded and unshielded
- Heavy-duty oil and sunlight resistant PVC, FRNC and PUR jackets
- CMX / outdoor rated designs

Be Certain with Belden Solutions

Belden is a global leader in signal transmission technologies – supplying time-proven, end-to-end communication systems and products that extend across office and industrial environments to provide unmatched reliability and peace of mind.

Belden's dominance in the industrial arena relates to a number of factors, principally:

- Decades of experience in the design and implementation of industrial products for all types of environments, using all media types
- Development of extremely robust, ruggedized products and systems for mission-critical and harsh environments
- Products that are fully compliant to all relevant IEC, IEEE and U standards
- 99.999% communications reliability – in even the most harsh or extreme environments

- Unequalled service and support, including network design, training and technical support
- An experienced, global distribution network
- Extended product and system warranties

Today, Belden provides continuous network availability for a broad range of energy applications across the globe – and a whole host of infrastructure applications, including traditional and alternative energy power generation facilities.

In the global, mission-critical power transmission & distribution industry, Belden's Hirschmann brand of Ethernet networking devices is the brand of choice. Extremely rugged Hirschmann devices provide the industry with 99.999% signal transmission.

Belden / Hirschmann at a Glance

- Global leader in high availability Ethernet technology
- Early pioneer in fiber communications
- Designed first modular and IP67 switches
- Invented first industrial fiber optic ring topology
- Leader in patented and industry-leading cable constructions (Bonded-Pairs, Beldfoil® shields)
- First in 802.11n wireless technology
- First hardened 10 Gigabit switch
- Hirschmann Switches:
  - 99.999% reliability
  - MTBF of 40+ years (based upon MIL-Spec accelerated destruction testing spec)
  - Temperature performance:
    0°C to +60°C; 32°F to +140°F (Extendable to -40°C to +70°C; -40°F to +158°F)
  - IEC 61850-3 / IEEE 1613 compliant
  - Wide range of approvals from standard authority (GL, KEMA, uL)
- Belden Cables:
  - Temperature performance:
    -40°C to +70°C; -40°F to +158°F
  - All cables UL and cUL listed
 - ISO / IEC 24702 certified

The Belden Competence Center

As the use and complexity of connectivity solutions have increased, so has the pressures on users to design, implement and maintain them. From plant-level Ethernet networks to Building Management Systems and from Data Centers to Broadcast Studios – all installations and applications require highly sophisticated installation, as well as complex operations and processes.

The Belden Competence Center offers access to unrivalled experience and technical support. Our staff has extensive hands-on experience in designing, installing and using solutions created with our range of Belden, Hirschmann and Tofino Security products.

Each member of Belden's service team has their own field of technical expertise, ensuring that customers get the very best assistance and support.
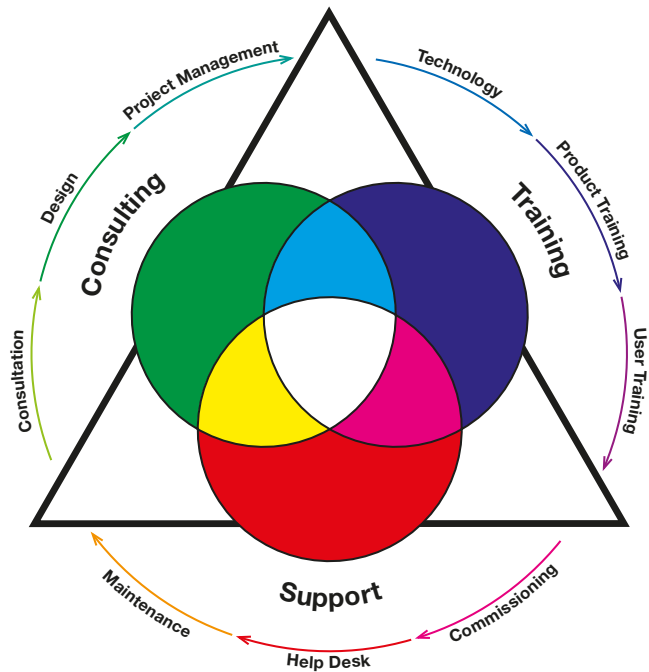
What we can do for you – and how

		Optimal Network Solution	Know-how for Reliable Operation	Protection Against Downtimes	Lasting Cost Control
	Consulting	• Individual consultation, design, project management • Network design and migration concepts • Compatibility testing • On-site wireless site survey	• Training plans • Documentation • Maintenance concepts • Security concepts (network security)	• Integration of redundancy • Spare parts store concept • Emergency concepts	• Service planning • Complete costing
	Training	• Technology and product training courses for network designers • Introduction courses for decision makers	• Individual user training courses • Security training • Workshops	• Qualification / certification of your employees and external service providers	• Update training for technologies and product
	Support	• Pre-configuration and pre-assembly of systems • On-site commissioning • Application tests	• Network monitoring and support by in-house experts or partners • Network security audit • Network baselining	• 24 x 7 support hotline • On-site support • Remote service • Replacement hardware services	• Warranty extension • Individual, product-related service packages

United States

Division Headquarters – Americas
2200 U.S. Highway 27 South
Richmond , IN 47374
Phone: 765-983-5200
Inside Sales: 800-235-3361
Fax: 765-983-5294
info@belden.com
Web: www.belden.com

The Netherlands

Division Headquarters – Europe
Edisonstraat 9, Postbus 9
5928 PG Venlo, 5900 AA
The Netherlands
Phone: 31-773-878-555
Fax: 31-773-878-448
venlo.salesinfo@belden.com

Asia Pacific

Hong Kong
7/F Harbour View 2
16 Science Park East Avenue
Hong Kong Science Park
Shatin, Hong Kong
Phone: 852-2955-0128
Fax: 852-2907-6933
hongkong.sales@beldenapac.com

Beijing
Room 2006, 20/F, Tower A,
Ocean international Center,
No. 56 the Eastern 4th Ring Middle Road,
Chaoyang District, Beijing China 100025
People's Republic of China
Phone: 8610-6591-8801
Fax: 8610-65918933
china.sales@beldenapac.com

Shanghai
Unit 301, No. 19 Building
1515 Gu Mei Road
Caohejing High-Tech Park
Shanghai 200233
People's Republic of China
Phone: 8621-5445-2388
Fax: 8621-5445-2366/77
china.sales@beldenapac.com

Guangzhou
Room 3012-3013 30/F,
South Tower No.371-375,
Huan Shi Dong Road
Guangzhou, China 510095
Phone: 86-20-8767-3260
Fax: 86-20-8767-3252
china.sales@beldenapac.com

Suzhou
333 Yanhu Road, Huaqiao Town
Kunshan City, Jiangsu Province
Suzhou, China 215332
Phone: 86-512-5796-1688
Fax: 86-512-5796-1222
china.sales@beldenapac.com

Gurgaon
Office No. 1007, 10th Floor, A Block
Iris Tech Park, Sohna Road, Sector 48
Gurgaon, India 122018
Phone: 91-124-450-9999
Fax: 91-124-450-9914
india.sales@belden.com

Mumbai
Unit 503, Wellington-II
Wellington Business Park
Off Andheri - Kurla Road, Opp. Skyline Ikon
Mumbai, India 400059
Phone: 91-22-4009-8200
india.sales@belden.com

Singapore
27 International Business Park
#05-01 iQuest@IBP
Singapore 609924
Phone: 65-6879-9800
Fax: 65-6564-9602
sales.ROAP@belden.com

Malaysia
Suite 1-2, Lower Level 1,
The Horizon Annexe, Avenue 7,
Bangsar South, No. 8, Jalan Kerinchi,
59200 Kuala Lumpur, Malaysia
Phone: 603-2247 1898
Fax: 603-2247 1878
sales.ROAP@belden.com

Indonesia
Wisma 46 – Kota BNI
16th Floor, Suite 16.08
Jl, Jend. Sudirman Kav. 1
Jakarta 10220,
Indonesia
Phone: 62-21-5799-3466
Fax: 62-21-5799-3468
sales.ROAP@belden.com

Thailand
33/4 The Ninth Towers, Tower A,
35th Floor, Room 3549 Rama 9 Road,
Huaykwang Sub-district,
Huaykwang District,
Bangkok 10310 Thailand
Phone: 662-118-0347-48
Fax: 662-118-0301
sales.ROAP@belden.com

Philippines
One Global Place Level 10-1,
25th Street & 5th Street,
Bonifacio Global City, Taguig
Philippines
Phone: 632-224-2029
Fax: 65-6564-9602
sales.ROAP@belden.com

Vietnam
Unit 1708, Level 17, Gemadept Tower
6 Le Thanh Ton Street, Ben Nghe Ward District 1,
Ho Chi Minh City, Vietnam
Phone: 84-8-6255-6898/9
Fax: 84-8-6255-6801
sales.ROAP@belden.com

Japan
Dai 2 Yanagiya Building 2F, 1-12-8
Nihonbashi, Chuo-Ku,
Tokyo 1030027, Japan
Phone: 81-3-6860-8120
Fax: 81-3-3516-2519
sales.ROAP@belden.com

South Korea
18F, Taesuk Building 275-5,
Yangjae-dong, Seocho-gu,
Seoul 137-943, Korea
Phone: 82-2-3497-0331
Fax: 82-2-3497-0333
sales.ROAP@belden.com

Australia
Ground Suite 1, Building A,
18-24 Ricketts Road, Mount Waverley Vic 3149
Australia
Phone: 1800-500-775
Fax: 613-9347-8274
australia.sales@belden.com

Contact us