Graybar is Your Nationwide Resource for Automation, Networking, Electrical, Safety and Security Solutions.

AUTOMATION AND CONTROL SOLUTIONS FOR THE INDUSTRIAL CUSTOMER
Let Graybar’s team of Industrial customer-focused sales professionals and automation and control technical specialists help you select solutions designed to:

INCREASE OUTPUT
• Improve throughput with improved process control
• Improve quality with improved process control

REDUCE COSTS
• Select the right automation and control products for lower equipment and system maintenance costs
• Enable online monitoring and predictive diagnostics to reduce costs

SAFETY
• Select sensing and signaling solutions to provide a safe production environment
• Incorporate intrinsic safety solutions

TRAINING SERVICES
Graybar’s long-standing relationships with brand-preferred manufacturers of automation products helps us bring you new technologies. In addition to our consultative sales assistance, we offer manufacturer-sponsored product seminars and demonstrations. We can provide scheduled or customized training on-site at Graybar, in factory classrooms or at your facility.

SINGLE-SOURCE CONVENIENCE FOR A WIDE RANGE OF PRODUCT CATEGORIES
Graybar offers single-source convenience, whether you’re buying replacement products and supplies, or need to design a whole new Web-enabled automation network. Graybar offers a broad product offering, extensive experience and a national distribution system. Graybar can also help you select solutions designed to consolidate your purchasing efforts, reduce your costs of acquisition, streamline productivity, speed time to market and add value to your company’s strategic efforts.

TECHNICAL SUPPORT
Graybar’s technical staff provides custom solutions, products and support for a variety of markets and applications including:

END USERS
• Oil and gas
• Food and beverage
• Automotive
• Chemical and petrochemical
• Power generation
• Water/wastewater
• Metals
• Mining
• Traditional manufacturing
• High-tech industrial

OEMS
• Packaging equipment manufacturers
• Material handling
• Cutting machinery
• Material working machinery
• Pump manufacturers
• Electronics

INTEGRATORS
• Automation integrators
• Control system integrators

COAST-TO-COAST AND BORDER-TO-BORDER AVAILABILITY
With more than 260 North American distribution facilities, Graybar offers a full complement of best-in-class automation, telecommunications, networking, electrical and security products. Graybar is a truly national automation supplier.
| 4 | Enclosures                              |
| 8 | PLCs and I/O                           |
| 12| Power Monitoring                       |
| 13| Industrial PCs                         |
| 13| Operator Interfaces                    |
| 15| Tower Lights and Beacons               |
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| 21| Surge Protection Products              |
| 23| Power Supplies                         |
| 24| AC Drives and Soft Starts              |
| 26| Enclosed Drives and Soft Starts        |
| 28| Sensors                                |
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| 30| Software                               |
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| 35| Cables and Connectors                  |
| 38| Contactors and Starters                |
| 39| Terminal Blocks and Interface Products |
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| 44| Pneumatic Motion and Control           |
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ENCLOSURES

Free-Standing and Floor-Mount Enclosures
Hoffman
For large control applications where large and/or numerous devices are required, Hoffman offers a complete range of floor-mounted and free-standing enclosures up to 90 inches tall, with single and multi-door options available in UL Type 1, 12, 4 and Type 4X protection ratings.

Modular Enclosure Systems
Hoffman
The Hoffman PROLINE™ modular enclosure system is an ideal solution for applications as diverse as marshalling, control systems, variable frequency drives and distributed control systems. PROLINE® allows you to add bays and options to meet your changing needs.

Disconnect Enclosures
Hoffman
For managing power distribution, Hoffman offers a complete lineup of disconnect enclosures. Models range from medium sized, wall-mounted traditional and CONCEPT™ styles, to large floor-mounted and free-standing units. For added safety and compliance with NFPA, SAE, and IEC directives, the door latching system interlock and defeater handle ensures that operators cannot access potentially dangerous enclosed equipment under live power.

Arc Flash Safety
Hoffman
SEQUESTR™ external disconnect enclosures eliminate risk and potential injury to personnel and equipment. Maintaining NFPA 70E compliance through conventional methods can be costly. Instead, choose Sequestr external disconnect enclosures that use a power isolation enclosure on the side, which is interlocked to a main enclosure to isolate - or sequester - the fused disconnect switch or circuit breaker from the main control panel. You and your technicians can work inside the main enclosure without the need for personal protection equipment.

Wall-Mount Enclosure Solutions
Hoffman
Offering the widest array in wall-mount solutions in the industry, Hoffman’s newest wall-mount enclosure offers a POWERGLIDE handle with 3-point latch, UL Type 4 protection that is ideal for applications where a robust seal cannot come at the cost of being easy to access.

Space Savings and Easy Access to Rack-Mounted Equipment
Hoffman
Hoffman’s PROTEK™ conserves valuable factory-floor space, and keeps electronics out of the way of machinery, delivering an industrial-strength solution that can be used in multiple environments, including:
- Production Monitoring Systems
- Wireless Access Points
- Building Automation & HVAC
- Security
- Audio-Video Systems
- Telecommunications

Hoffman Sanitary Solutions
Hoffman
Hoffman Watershed™ enclosures provide superior protection in harsh washdown environments, while minimizing potential contamination catch points using a 20-degree sloped top that meets stringent sanitary certification requirements of NSF International.

Clean Room Enclosures
Hoffman
For applications that call for controls or other electrical components to be mounted in the area where pharmaceuticals are manufactured, additional design, mounting and enclosure finish options should be considered. Gaskets on clean room enclosures also require additional sanitary design criteria. Hoffman’s PHARMAPRO™ enclosures are specifically designed for the pharmaceutical industry with flush mounting and a low RA value finish. Adjustable-depth mounting system is included with each enclosure. Select from 11 standard size options available in both hinged-door or screw cover.
ENCLOSURES continued

INLINE™ Instrumentation Enclosures
Hoffman
When applications require mounting electrical components the full width of the enclosure, the landscape orientation of this aesthetic INLINE™ Enclosure makes this possible. The full-width mounting brackets can be drilled anywhere along their length, providing maximum mounting flexibility.

CONCEPT™ Wall-Mount Enclosures
Hoffman
CONCEPT™ Enclosures offer streamlined styling, flush latches and an attractive, durable finish. Most importantly, these enclosures protect sensitive electrical or electronic components in demanding environments.

- One-door, two-door and flush wall-mount enclosures
- For indoor or outdoor applications
- HMI models for applications incorporating flat-screen panels, pushbuttons, lights, etc.
- Window options available
- Offered in stainless steel and painted polyester 14, 16 or 18 gauge steel
- CONCEPT™ EMC Enclosures offer protection from electromagnetic interference (EMI) signals produced by internal components and external EMI/RFI interference
- Seamless foam-in-place, one-piece gasket

Pushbutton Enclosures
Hoffman
Hoffman Pushbutton Enclosures are available for standard 30.5-mm and 22.5-mm pushbuttons, switches and pilot lights. Offered in 16 or 14 gauge steel, Hoffman enclosures provide protection against dirt, dust, oil and water. Extra-deep designs are available to accommodate additional contact blocks for pushbuttons.

WEATHERFLO™ and WEATHERFLO™ HD Type 3R Vented Enclosures
Hoffman
Rugged protection and cooling for variable frequency drives from 3HP to 500 HP VFDs.

Ensure sustained operation of your variable frequency drives (VFDs) in harsh outdoor environments with the Hoffman WEATHERFLO and WEATHERFLO HD solutions. Forget the hassle of designing a custom solution to house VFDs, adding cooling and hoping the solution will withstand precipitation, debris, animals and more. WEATHERFLO HD is the first comprehensive solution designed specifically to house VFDs in extreme environments—from irrigation pumps to HVAC and general industrial drives. The WEATHERFLO family of enclosures is the first off-the-shelf comprehensive solution available.

The WEATHERFLO HD enclosure features shielded impellers to keep dust out of bearings, stainless steel mesh screens on the top and base to keep out animals and debris and robust aluminum construction, WEATHERFLO HD withstands elements—in the short and long term. Designed for simple installation. Engineered for robust protection and minimal maintenance. Feature rich and tested to extreme in Hoffman’s UL certified test lab. WEATHERFLO HD offers the most complete assembled solution for meeting the demands of heavy-duty VFDs in challenging applications across the globe.

HMI Systems
Hoffman
Hoffman’s Human-Machine Interface (HMI) Enclosures, pendant arms and accessories protect operator interface terminals, LCD panels, industrial PCs and controls in demanding industrial environments while providing ergonomic solutions that meet the needs of a wide range of users and applications.

Non-Metallic Enclosure Solutions
Hoffman
Specifying the ideal material for optimal performance and increased enclosure life is important. Hoffman offers an array of construction materials including fiberglass, polyester, polycarbonate and ABS. Non-metallic enclosure solutions are available in small junction boxes to the widest range of control enclosures, including wall-mount and large freestanding models. Hoffman’s newest ZONEX™ non-metallic terminal enclosure meets ATEX Directive 94/9/EC.
Accessories
Hoffman
From Hoffman’s H2OMIT™ that removes condensation protecting sensitive electrical and electronic equipment to its new Non-Metallic Window Kits for indoor and outdoor Type 12, 13, 4, and 4X applications, Hoffman offers a complete line of accessories to meet all your needs. Most accessories meet UL requirements, including:
- HOL-SEALERS™ Hole Seals
- Lock Kits
- Door Stop Kit
- Replacement Keys
- Handle Kits
- LED Light Kits
- Gasket Replacement Kits
- Touch-up Paint
- Floor Stand Kits
- See more accessories at, PentairProtect.com

Cooling Solutions
Hoffman
While new generations of high-density electronics pack more processing power into smaller spaces, a new threat to reliable operation is emerging – the electronics themselves. Hoffman cooling solutions counter the effects of heat build-up from internal or external sources and manage airflow to create conditions optimal for performance and long service life. Hoffman’s new SpectraCool Remote Access Control allows you to monitor and control operation from a personal computer.
Other solutions include:
- SPECTRACOOL™ Hazardous Location Air Conditioners
- Thermoelectric Coolers
- Heater Exchangers
- Filter Fans
- Vortex A/C Enclosure Coolers

Modified and Custom Enclosures
Hoffman
When standard enclosures do not meet the needs of your application, Hoffman offers over 12,000 standard products that can be quickly modified to your requirements. You can design your standard by downloading Hoffman’s standard drawing and selecting modifications such as size changes, holes, cutouts, panel and door styles, internal barriers, hinges, mounting options, adding accessories and changing paint colors or finish.
If your design requires a solution more complex, Hoffman has the most comprehensive custom enclosure engineering and fabrication in the industry.

Miniature Circuit Breaker Lockout Devices
Panduit
No-tool option quickly locks out miniature circuit breakers without the use of a tool.

Plenum Rated Hook and Loop Cable Ties
Panduit
Delivers reliability by protecting against over-tensioning high performance cables.

PanelMax™ Shielded Wiring Duct and Noise Shield
Panduit
Provide up to 20dB noise reduction (equal to six inches of air space).

cULus Listed Braided Bonding Straps
Panduit

UL and CSA Listed Universal Ground Bar
Panduit
Provides the most flexible grounding solution for your panel.

Spiral Wrap
Panduit
Provides abrasion protection to hoses/cables while harnessing multiple hoses/cables into a single manageable bundle.
PanelMax™ DIN Rail Wiring Duct
Panduit
Up to 30% space savings vs. conventional duct/rail layouts.

Copper Patch Cords
Panduit
Available in shielded and UTP Category 6A, 6, and 5e options for keyed and non-keyed applications. A variety of colors and lengths provide additional design flexibility.

PanelMax™ Corner Wiring Duct
Panduit
Up to 20% space savings in layouts with side and back panels.

Dynamic Cable Manager
Panduit
Provides strain relief at the hinge of control panel door to extend service life.

Hinged Cover Wiring Duct
Panduit
Hinged cover eases access allowing simple wiring changes to be made up to 20% faster compared to conventional wiring duct installations.

Halogen-Free Wiring Duct
Panduit
Up to 203°F (95°C) operating temperature.

Ferrule End Sleeves
Panduit
Control stranded wires in terminal blocks providing superior termination performance.

Control Panel Switch Cable Tie Mount
Panduit
Provides strain relief behind control panel buttons.

Pan-Wrap™ Split Harness Wrap
Panduit
Patented slot pattern provides improved flexibility and cable abrasion protection with reduced installation time.

Adhesive Backed Mounts
Panduit
Premium adhesive for a long-term, reliable bond; adhesive backing allows routing of wires and cables where mounting holes cannot be drilled.

ARC Flash and Safety Labels
Panduit
Pre-printed and blank labels.

WARNING
Risk of Fire or Electric Shock
The opening of the branch-circuit protective device may be an indication that a fault current has been interrupted. All current carrying parts and other components protected by this device should be examined and replaced if damaged. If burnout of a current element of an overload relay occurs, the complete overload relay must be replaced.

Arc Flash and Safety Labels
Panduit
Pre-printed and blank labels.

PANDUIT    PVS0507W2201Y
Twido Programmable Controller

Schneider Electric

The Twido Programmable Controller is an ultra-compact controller designed especially for small control systems from 10 to 100 I/O. Automate any small machine with Twido and reduce your panel size and control system costs! Easy to wire, easy to install, easy to operate and easy to program, this ultra-compact controller makes it simple to pack more functionality into a smaller footprint. Its design, comprehensive range, expansions and accessories make Twido one of the most powerful and flexible nano controllers on the market today. The newest addition to the Twido family, Twido Extreme is specifically designed for severe environments and on board applications of mobile equipment. Programmed using TwidoSuite programming software.

Zelio Logic Relay

Schneider Electric

Designed for the management of simple automation systems comprising 10 to 40 I/O, Zelio Logic smart relays, with their unique combination of value for money and ease of use, provide a real alternative to solutions based on cabled logic or specific cards. Simple to select, install and program, Zelio Logic is suitable for all your applications. Flexible, it offers you the choice of 2 ranges – Compact versions with fixed configurations and Modular versions which allow the use of extension modules and 2 programming languages (FBD or LADDER).

Modicon M340 PLC

Schneider Electric

The Modicon M340 PLC is powerful, small and exceptionally rugged, with cutting-edge features you won’t find in other mid-range PLCs.

- Compact size, height: 100 mm; depth: 93 mm for integration in 150 mm enclosure
- Adaptable rack; 4, 6, 8 or 12 modules; hot swap function for easy maintenance
- Supports multiple, open networks including CANopen, Ethernet Modbus TCP/IP and EtherNet/IP (the new ODVA standard combines standard EtherNet/IP with Modbus TCP/IP)
- Programs with Unity Pro LL984 for 340 software
- Battery-less

Modicon Premium

Schneider Electric

Modicon Premium is an optimized automation platform for simple to complex machinery, factory automation applications and infrastructure.

- Up to 7 MB of program memory
- Compact size and high density I/O modules
- Extension racks for multi-rack architectures
- Extensive catalog of sensor/actuator buses, machine buses and fieldbuses
- Integrated Ethernet TCP/IP port on many CPUs
- Motion control, electronic cam, weighing and machine safety modules available
- Supports multiple, open networks including Ethernet Modbus TCP/IP and EtherNet/IP (the new ODVA standard combines standard EtherNet/IP with Modbus TCP/IP)
- Programs with Unity Pro and PL7 software
- High-performance, cost-effective hot standby solution provides high availability optimized for Ethernet I/O

Modicon Quantum

Schneider Electric

Modicon Quantum is an optimized automation platform for batch/ process applications with a high level of performance for process control and architecture availability.

- Supports deterministic Ethernet Remote I/O networks on standalone and hot standby CPUs with significantly superior performance over other I/O systems that are distributed on Ethernet for I/O Scanning
- Up to 7 MB of program memory
- Powerful process control library
- Supports fieldbuses for batch/process applications
- Integrated Ethernet TCP/IP Port on CPUs
- Special treatment to resist corrosive atmospheres
- Supports multiple, open networks including Ethernet Modbus TCP/IP and EtherNet/IP (the ODVA standard combines standard EtherNet/IP with Modbus TCP/IP)
- Programs with Unity Pro, ProWORX 32 and Concept software

Modicon Micro

Schneider Electric

Micro is a good choice for smaller machines, mobile systems and vehicles where minimal space requires maximum compactness, or when environmental conditions demand reliable performance. Micro PLCs enable machines to perform to their fullest potential. Programs with PL7 software.
Modicon M168 Programmable Logic Controller
Schneider Electric
The Modicon M168 Programmable Logic Controller allows you to:
- Reduce HVAC and R machine’s time to market by offering ready-to-use solutions
- Increase machine performance with a better control at full and partial loads by integrating variable speed drives and using energy efficient application function blocks
- Improve in-depth control of the HVAC mechanical systems such as rooftop HVAC, fan and ventilation, chillers and air handling systems from the building management systems.

Modicon M238 Logic Controller
Schneider Electric
As an optimized solution to repetitive machine applications, the Modicon M238 controller offers high performance at low cost with efficient embedded features dedicated to simple axis motion control (high speed counting, PTO, application function blocks). Embedded CANopen master allows easy and adaptable architectures for development flexibility. Economic digital, analogue or high speed counting expansion modules are available.

Modicon M258 Logic Controller
Schneider Electric
Compact, expandable and easy to install, these controllers are designed for machine builders (OEMs) to offer speed control, high speed counting, motion and communication networks. The controller includes a CPU (22ns/inst), embedded communication ports (Ethernet and CANopen master) and advanced built-in features such as data logging, WebServer and FTP server.

Advantys STB and OTB Distributed I/O
Schneider Electric
Advantys STB and OTB are complete distributed I/O ranges of interfaces and system integration platforms for all types of applications, from simple, compact machines to the most complex.
- Simplified maintenance using on-board diagnostics
- Reduction of setting-up and commissioning times of installations
- Reduction in size of enclosures
- Reduction in cabling costs
- Reduction in cabling errors
- Assisting machine design
- Simplification of machine architectures
- Can be configured from within Unity Pro software

Modicon M221 Logic Controller
Schneider Electric
Modicon M221 logic controller: the best performance for its size!
Available also in book format, it requires minimal installation and offers tremendous versatility. Connect a simple remote operator panel for instant maintenance and machine visualization.
- Class Leading CPU performance
- Compact or Modular Form Factor
- 2 Analog inputs embedded (10Bit)
- 16, 24, or 40 I/O Compact
- 16 or 32 I/O Modular
- Ethernet / Serial Line
- 2 Pulse Train Outputs (PTO) w/ S-Curve
- TMC Cartridge expandability (Compact – TMC2)
- Remote connectivity

Modicon M241 Logic Controller
Schneider Electric
Modicon M241 logic controller: the benchmark for compact machine controllers!
Offering best-in-class communication with 5 embedded ports. State of the art technical features and embedded CANopen for fieldbus architectures up to 63 devices while reducing your installation time and cost. Get unlimited access to your machine via Ethernet - everywhere and any time and simplify maintenance with any mobile device through visualization pages designed directly inside SoMachine and stored in the PLC’s web server. Everything you need is embedded.
- Class Leading CPU performance
- Compact Form Factor
- 24 or 40 I/O Compact
- Ethernet / 2 Serial Lines
- CANOpen available (63 Slaves)
- Pulse Train Output (PTO) w/ S-Curve
- TMC Cartridge expandability (TMC4)
Modicon M251 Logic Controller

**Schneider Electric**

**Modicon M251 logic controller - your choice for modular and distributed architectures, that connect everything!**

The Modicon M251 with CANopen or Modbus TCP lets you easily connect to SCADA, MES, ERP by standard Ethernet cables and even via Wi-Fi. Boost your machine's performance with data transfer via SD Card, embedded web server and more. Get unlimited access to your machine via Ethernet - everywhere and any time and simplify maintenance with any mobile device through visualization pages designed directly inside SoMachine and stored in the PLC's web server. Get all the flexibility you need and save space in your cabinet:

- Class Leading CPU performance
- Modular Form Factor (54mm wide)
- No I/O Embedded
- Ethernet (up to 2 networks) / Serial Line
- CANOpen available (63 Slaves)
- Ethernet I/O Scanner available (Modbus TCP)

Zelio Relays and Temperature Controllers

**Schneider Electric**

A complete range of relays combining simplicity, reliability and availability

- RXM Miniature Relays (Ice Cube)
- RXG Interface Relay
- RUM Universal Relays
- RTC Temperature Controllers

Fieldline Modular IP67 I/O

**Phoenix Contact**

Fieldline Modular is an I/O system designed to be installed directly in the machine without the need of control cabinets. The I/O stations can be assembled using with a bus Interface unit and up to 16 I/O expansion modules. Interfaces are available for Ethernet/IP, Profinet, Modbus/TCP, DeviceNet, Profibus, and Interbus. The local I/O expansions are available in Digital, Analog, RTD, and even Wireless. For applications with limited space Digital I/O is available in M8 housings.

AS-Interface

**Phoenix Contact**

AS-interface is a simple network, especially suitable for highly distributed machine automation. AS-interface uses a low-cost electromechanical connection system designed to connect four to seven point machine mount I/O modules over a two-wire cable carrying data and power. Mechanically coded cables ensure the I/O modules can be quickly installed or removed without errors. Flexible cabling supports star, line, branch and tree topologies with total network distances up to 300m with repeaters.

Sensor Actuator Boxes

**Phoenix Contact**

Passive sensor boxes are easy to install in the field and provide real savings in time, space and money vs. hard wiring I/O connections. The signal distribution box helps machine builders to save space because of the compact design and home run cable. Field installation is quick due to the pre-wired connectors (M5, M8, M12) for plug-n-play connection of quick disconnect or pigtail sensors and actuators. LEDs provide easy power and device status therefore troubleshooting is simplified.

Inline Modular IP20 I/O

**Phoenix Contact**

Inline Modular I/O provides a flexible I/O solution for in cabinet installations. The I/O stations can be configured using up to 61 expansion modules. These modules can be selected from a product catalog of over 100 variants. Included in these variants are options for digital, analog, temperature, intrinsically safe, safety and special function. Additionally network interfaces are available for Ethernet/IP, Profinet, Modbus/TCP, DeviceNet, Profibus, CanOpen, MII, Sercos and Interbus.
**Sensor Actuator Cordsets and Connectors**

**Belden/Lumberg Automation**

Lumberg Automation has a diversified line of cordsets and connectors with a variety of pin configurations and cable/wiring options for on-machine sensors/actuator applications.

- Cordset types: single- and double-ended
- Connector types: receptacles, field attachables, splitters,
- Cable types: TPE, PVC, PUR, PUR/PVC and PUR-Halogen free
- Color codes: IEC, U.S., automotive and numeric
- Connector types: M5, M8, M12, 7/8", M23 and valve connectors
- Pin configurations: 2-19 pins
- Protection classes: IP 65, IP 67, IP 68 and IP 69K

**LioN-Link Modular Decentralized IP 67 I/O System**

**Belden/Lumberg Automation**

The LioN-Link peripheral I/O system can be used for line topologies of up to 100 m in length. The system comprises of bus coupling modules for interfacing with higher-level fieldbus systems, including Profinet, CANopen, DeviceNet or ProfiNet and independent I/O modules.

**Compact I/O Modules and Connectors**

**Belden/Lumberg Automation**

Lumberg Automation IP 67 components are especially designed for field applications. Supporting AS-Interface, Interbus, Profinet, CANopen, DeviceNet and Industrial Ethernet fieldbus systems.

- Configurations: 4, 8 and 16 ports DI, DO, DI/DO, DIO
- Housing material: Die-cast zinc, V4A, PBT or PUR
- Ambient temperature from -25°C/+60°C
- Protection class: IP 67, IP 68, IP 69K

**Actuator/Sensor Distribution Boxes**

**Belden/Lumberg Automation**

M8 and M12 actuator/sensor distribution boxes are used as a means to consolidate wiring directly on the machine while sending/receiving all signaling (inputs/outputs) directly to and from the control panel over one cable.

- Port configurations: 4-12 ports
- Protection class: IP 65, IP 67, IP 68 or IP 69 K
Metering
Schneider Electric

A full portfolio of metering and monitoring products, scaleable from simple metering and analysis to remote, online enterprise wide power management solutions.

**REVENUE METERS**

ION8600: ANSI socket meters for utility network monitoring.

ION8650: Next generation socket and switchboard meter for utility network monitoring.

**ENERGY AND POWER QUALITY METERS**


CM4000 Circuit Monitor: High performance meters for mains or critical loads on HV/LV networks.

**ENERGY METERS**

BCM (Branch Circuit Monitor): Current sensing device that monitors all poles of a 42-circuit Square D NQOD panel board within a power distribution unit.

EM4800 Multi Circuit Energy Meter: Provides a cost-effective and highly flexible revenue-grade submetering platform for new or existing facilities.

**MULTIFUNCTION POWER METERS**

ION7300: Highly-configurable meters for feeders or critical loads.

ION6200: Panel meters for feeders or tenant space

PM700 Power Meter: Compact, versatile meters for feeders or critical loads.

PM800 Power Meter: Compact, modularly flexible meters for feeders or critical loads.

PM1000 Power Meters: Cost-effective meters for basic metering of essential measurements.


CM4000 Circuit Monitor: High performance meters for mains or critical loads on HV/LV networks.

**ENERGY AND POWER QUALITY METERS**

ION8650: Next generation socket and switchboard meter for utility network monitoring.

ION7300: Innovative split-core CT form factor for basic electrical metering.

Enercept Meter: Flexible PowerLogic high density metering enables you to select any number of meters up to the cabinet’s threshold, giving you the option to expand as your needs dictate.

EM4800 Multi Circuit Energy Meter: High accuracy power and energy socket meter.

**DIGITAL METERS**

DM6000 Panel Meters: Digital volt amp frequency (VAF) meters.

E5600 Power and Energy Meter: Accurate electric energy metering and simple, easy installation.
**Magelis Industrial PCs**

*Schneider Electric/Telemecanique*

The Magelis Industrial PCs — a complete range of industrial PCs designed to optimize your operator interface applications. The modular design of Magelis Modular IPC offers users flexibility when developing their applications. Telemecanique's new Magelis Smart and Compact IPC industrial PCs complement the range, characterized by their compactness, simplicity and easy set up. Used in conjunction with Telemecanique's software products and Web servers, the Magelis IPC offer provides a complete HMI solution that is smarter and more intelligent, yet even easier to set up and operate.

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**Magelis GTU**

*Schneider Electric/Telemecanique*

The Magelis GTU allows users to create the ideal HMI for their application by simply snapping together the panel box and display of their choice. It is as easy and comfortable to use as a smartphone or tablet, with intuitive navigation and many connectivity options, including remote access.

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**Magelis XBT-N and R**

*Schneider Electric/Telemecanique*

The Magelis XBT-N and R are compact, cost-effective text and graphical terminals ideal for simple and repetitive machines. It's one of the few HMI solutions in its class rated NEMA 4X for outdoor use and UL Class 1, Division 2 for hazardous locations. This line of small, text and graphical HMI is an ideal companion for small PLCs. Magelis XBT-N and R offer faster response times to operator actions by either displaying text messages, graphical alerts or changing screen's color (XBT-R only). With a maximum depth of only 78 mm, Magelis XBT-N and R has a wider operating temperature range and performs at higher speeds than other HMI solutions.

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**Magelis STU Graphic Display Terminal with Touch Screen**

*Schneider Electric/Telemecanique*

Featuring a quick mounting system and easy-to-use configuration software, the Magelis STU range can significantly reduce the overall cost of your installation, saving you time and money!

- Tool-free installation with no special drilling requirements, thanks to the 22 mm diameter push button mounting system
- Expandable, modular design with removable 3.5” or 5.7” screen
- Ease of maintenance:
  - LED backlight, no batteries required
  - Removable power supply connector
- Flexible programming
- Modular design with removable 3.5” or 5.7” screen
- Clear, precise color QVGA 65K touch screen
- Embedded Ethernet connection for faster, more open communication
- Multi-protocol RS485/232 standard RJ45 ports and USB ports (mini and standard versions)
**Magelis STO with Graphic Screen**

**Schneider Electric/Telemecanique**

The new Magelis STO panels enhance the Magelis small panels range by offering more flexibility, more communication capability and a quick and easy revolutionary mounting system. Powered by Vijeo Designer software, these panels bring a cost-effective solution to all machinebuilders.

- Touchscreen 3.4", 200 x 80 pixels
- Two three-color versions available: HMISTO511 (green, orange, red) or HMISTO512 (white, pink, red)
- Tool free mounting with Magelis spring clips

**Magelis XBT GC Compact HMI Controller**

**Schneider Electric/Telemecanique**

The line of Magelis terminals includes eight small-footprint, text display terminals and a semi-graphic compact terminal that offers the choice of a keyboard and/or touchscreen interface. Easily perform diagnostics and adjust your control system devices — the Magelis XBT terminal brings you greater convenience and ease of use, with a substantially reduced size.

- High visibility display
- Units available to display from one to 10 lines
- Looped text scrolling
- Open to international applications
- Multiple languages: ASCII, Cyrillic, Greek, Japanese and Chinese
- 128 customizable characters
- Text import/export for translation
- Number of languages for your application limited only by the memory of your Magelis XBT
- Ergonomic
- Large choice of user interfaces
- Touchscreen/keypad or keypad only
- Eight to 20 keys
- Customizable and configurable key using sets of labels
- Only one software for the entire compact range: Vijeo Designer Lite
- Easy to integrate, to assemble and wire

**Magelis XBT GTW Graphic Terminals**

**Schneider Electric**

The Magelis XBT GTW terminal employs a Windows environment and allows you to navigate freely on the Web. Use with Vijeo Designer configuration software to multiply its potential and benefit from true multimedia functions. With installed Media Player, access multimedia capabilities such as streaming video, webcam management and sound from an integrated output. View all web pages locally or remotely for easy diagnostics and maintenance.

**Magelis GTO**

**Schneider Electric**

The Magelis GTO range of HMI’s offer optimum performance and scalability using Vijeo Designer software.

**State of the art display**

The 5 screen size range consists of a 65 K colour TFT screen that provides the best-ever visualisation of Magelis human machine interfaces. Magelis GTO offers remote access and control through the Vijeo Design ‘Air APP. Embedded Ethernet provides easy integration in your IT structure.

**Magelis SCU**

**Schneider Electric**

The Magelis SCU provides HMI and controller in one capability with the innovative 22mm mounting system. Offering maximum functionality while keeping installation easy, the Magelis SCU provides built in I/O (digital and analog) to allow total machine control suitable for small machines and simple processes. Eliminate the need for a PLC!

**Same time and money**

- No need for a PLC on applications with limited I/O needs
- Easy installation with the Ø 22mm mounting system
- Capable of “split” mounting (screen on panel front, processor on DIN rail in panel)

**Magelis GTU**

**Schneider Electric**

Magelis GTU offers the best flexibility with its unique concept: combine a CPU box with a display of your choice

- Introducing Smartphone-like interface into the industrial world; powered by Vijeo XD, Magelis GTU is the first HMI with resistive multitouch screen without limitation.
- Availability of 4/3 and 16/9 format, and multi display function.
- Ensure high level of performance and openness
XVP 50 mm Tower Lights and Beacons
Schneider Electric/Telemecanique

Semiconductor, packaging, material handling and conveyor equipment OEMs and facility engineers now have a better means of checking production status and machine operation sequences with the new TELEMECANIQUE XVP Tower Light from Schneider Electric. The modular XVP design allows maximum flexibility in use because modules snap into place with a simple twist-and-click action. Maintenance is minimized due to the protected LED illumination source. Assembly is accomplished without tools - just twist and click. The XVP line is a product of the same design team that introduced the original XVA and the revolutionary XVB Tower Lights.

- 50 mm diameter with outstanding brightness in a slim, compact package.
- Lens colors: red, yellow, amber, green, blue and clear.
- Protected LED bulb-style lamps have an average life of 100,000 hours. Excellent “true color” LED illumination with all standard colors in steady and flashing.
- Lamps with built-in electronic circuitry to protect against, spikes, surges, EMI and PLC leakage currents.
- High degree of protection with NEMA and UL Type 12 and IEC IP65.
- Ring and base trim available in black or off-white to match your application.
- Mounting options include direct, stand with tulip base, wall bracket with hood or tube bracket.

XVE Tower Lights and Beacons
Schneider Electric/Telemecanique

XVE beacons and Tower Lights are designed for remote signaling of the status of a machine, equipment or specific application, either visually using 360° illuminated units or audibly using an 85 dB buzzer. Telemecanique XVE 70 mm Optimum products provide just the specific feature sets OEMs want most. Perfect for the cost-conscious facility engineer or machine builder who desires remote signaling with the best feature set for the price, without any unnecessary features. The XVE Optimum range provides efficient signaling (5 colors available), at medium range distances 98.4 ft (30 m), in indoor environments. The standard configuration of the beacons and indicator banks is NEMA and UL Type 12 (IP 42) degree of protection, which is sufficient for the majority of indoor applications. Both pre-configured beacons and indicator banks can be upgraded to IP 54 by using a sealing kit.

- The beacons are supplied complete and incorporate a single steady or strobe light illuminated unit and a short mounting base. They are ready to use.
- The tower lights are assembled by the user and comprise signaling units, mounted on a base unit and a mounting base. For an indicator bank, a maximum of 5 illuminated units or 4 illuminated units and 1 audible unit can be assembled.
- The illuminated or audible units are easily assembled. A screw secures their mounting. Electrical connections between each unit are made automatically as the units are mechanically assembled.
- All the signaling units are identical in size and their positioning is unrestricted.

XVB 70 mm Tower Light
Schneider Electric/Telemecanique

Packaging, material handling, conveyor and semiconductor equipment OEMs and facility engineers now have a better means of checking production status and machine operation sequences with the new Telemecanique XVB Tower Light from Schneider Electric. Modular in design, the XVB allows for maximum user flexibility with simple installation and maintenance. Quick installation and improved LED performance minimize the time needed by facility engineers to maintain the Tower Light. Without any tools necessary, a one to five bank assembly is accomplished with of a simple twist-and-click action.

- Maintenance-free bulb style LED lamps have an average life of 100,000 hours.
- The banks or single stage beacons are also available in 7 and 10 watt incandescent and have an optional 5 or 10 joule strobe.
- The XVB offers an excellent “true color” LED illumination with red, green, yellow, blue and white as standard colors. This is one of the only LED ranges in the industry offering blue and white.
- High degree of protection (IP65/Type 4X)
- 45 mm mini-beacon in LED or Incandescent
- Long range signaling through stand alone sirens and rotating mirror lights

XVU Tower Lights
Schneider Electric/Telemecanique

Harmony XVU is the super bright modular tower light that can be customized to meet your needs.

BRIGHT: Optimize visualization in your plant
FLEXIBLE: Innovative mounting solutions
AESTHETIC: Give a sleek look to your machine
INNOVATIVE: Easily customize your tower light
SIMPLE: Improve your inventory management
** Lean Managed Switch  
Phoenix Contact  

The Lean Managed Switch (LMS) is a compact, powerful and economical managed Ethernet switch. Support of SNMP (Simple Network Management Protocol), RSTP (Rapid Spanning Tree Protocol) and easy Web-based management capability are standard features. These features make the LMS into the ideal solution to add network configuration capability, remote monitoring and diagnostics and integral IT compatible network redundancy to applications where the use of managed switches may previously have been cost prohibitive. In addition, to support applications where Multicast traffic is a concern (like when using Ethernet/IP), an “-E” version of the LMS is available with default enabled IGMP Snooping and IGMP Query functions.

** Industrial Ethernet Cordsets  
Phoenix Contact  

Phoenix Contact offers a full line of Ethernet connectivity products:
- 2-pair (up to 100 Mbps) RJ45 / M12 D-code
- 4-pair (up to 1 Gbps) RJ45 / M12 A-code
- 4-pair (up to 10 Gbps) RJ45 / M12 X-code

IDC Field-wired connectors and panel feed-through adapters make a complete installation both easy and fast.

** SMCS Managed Switches  
Phoenix Contact  

The Smart Managed Compact Switch (SMCS) offers 8 and 16 port models, with Gigabit throughput capability and Fast Ethernet (10/100TX) variants. The SMCS is suited to operate equally well within Profinet and EtherNet/IP installations, as well as standard Ethernet applications. SMCS versions come in all copper and copper/fiber mix models. The fiber models have two Gigabit fiber interfaces to accommodate the use of SFP (Small Form-factor Pluggable) modules or 100Mbps multimode and single mode fiber. The eight-port 10/100 version opens the network possibility of Gig fiber uplink/ring capability with Fast Ethernet downstream operation. SMCS models have ATEX Zone 2 certification.
**SFN Unmanaged Switches**

**Phoenix Contact**

SFN (Standard Function Narrow) switches from Phoenix Contact provide low-cost, fully industrially hardened, entry level switch functions with 5 to 16 ports (10/100 Mbps) in a narrow housing width. These include a complete range of 100Mbps glass fiber configurations to support one or two ports with SC or ST style connectors. SFN switches include the unique ability to add optional security frames that can be used to block unused RJ-45 ports or lock in existing cables. This “physical layer 1” security restricts network access by unauthorized personnel, yet remains simple for plant floor personnel to implement. For entry level applications, inexpensive SFNB switches offer up to eight ports and transmission speeds of 10/100 Mbps. The space-saving metal housing and temperature range of -10 to +60 degrees Celsius ensure operation in industrial environments. For reliable switching over large distances, three fiber optic variants are provided for single-mode and multi-mode fiber connections. SFNT designated switches in this line afford users with an extended temperature range of -40°C to +75°C, as well as options for user-selectable port link monitoring. The SFN series also includes industrial unmanaged IEEE 802.3z Gigabit switches for applications requiring either intense data or the anticipation of future network expansion. The 8 port Gigabit SFN switches support Jumbo Frames, and provide a broad range of connectivity by allowing 1 or 2 fiber ports, multimode and single mode glass fiber options for distances up to 20km. State-of-the-art Gigabit technology includes Jumbo Frames, and provide a broad range of connectivity by allowing 1 or 2 fiber ports, multimode and single mode glass fiber options for distances up to 20km. State-of-the-art Gigabit technology includes twisted pair 10/100/1000 capability on all ports.

**Industrial Modems**

**Phoenix Contact**

The Phoenix Contact industrial modem line connects you worldwide with machines and systems – for efficient remote maintenance, permanent data acquisition and automatic advanced alarming. The PSI-MODEM line consists of the following:

- Analog dial-up connections using standard Public Service Telephone Networks (PSTN) allow access to serial and Ethernet remote controllers and network devices.
- DSL high speed permanent line modems use existing copper cable infrastructure for permanent connections and speeds up to 30Mbs. Easily supports streaming video and data acquisition.
- Cellular based modems provide network security and reliability of data transmission over cellular networks. Available for AT&T, Verizon and T-Mobile.

The Phoenix Contact industrial modem line offers an optimum remote access for every application.

**FL MGUARD Firewall, Router and VPN**

**Phoenix Contact**

The FL MGUARD line provides IT functionality in an industrially rugged housing. The MGUARD’s core features are its flexible firewall to protect your plant network from unwanted access and unnecessary traffic, routing and NAT routing to allow you to be insulated and isolated from the IT network while having flexibility in your IP schemes, and an IT compliant and interoperable VPN. This allows for secure remote connectivity either point to point or through the free mGuard Secure Cloud service, allowing remote support and troubleshooting. The mGuard comes in both DIN mount and PCI card form factors.

**Managed Ethernet Infrastructure Switches**

**Phoenix Contact**

Phoenix Contact 3000 and 4000 series managed Ethernet switches are specially tailored to the requirements of today’s infrastructure applications. Models are available in various five to sixteen port Fast Ethernet and Gigabit configurations. Support for up to four fiber ports with different fiber types, speed, and connectors enable flexibility in any deployment, while the extended temperature range enables universal use even under extreme environmental conditions. The switches support a comprehensive suite of IT-compatible functions, IEE security policies, various high-performance network redundancy methods, and numerous network performance management options that enable consistent integration into IT network structures.

**Modular Fiber Optic Networking**

**Phoenix Contact**

Converting a copper-based bus system completely or partially to fiber optics has many advantages, which include:

- Immunity to electrical interference
- Isolation within the network
- Exceeding electrical restrictions such as maximum distance, length, speed or topology
- Increasing the reliability of an entire network infrastructure

The following electrical standards and protocols are supported:

- RS232, RS422, RS485 2 and 4 wire
- Modbus
- Profibus with redundant ring capabilities
- DeviceNet, CanOpen and ControlNet

Flexible topologies using PSI-MOS are easily created with Phoenix Contacts Din-Rail T-bus backplane. Power and data are bussed between fiber optic modules and copper to copper repeaters with a single data cable connection.
### SPIDER Unmanaged Industrial Ethernet Switches

**Belden/Hirschmann**

The SPIDER family offers a wide variety of plug and play, low-cost, industrial Ethernet switches with options including 2 to 18 ports, fiber optics, extended temperature range (-40°C to +70°C), Power over Ethernet (PoE) and Gigabit.

- Ports: copper RJ45/fiber SC, ST, SFP/LC
- Speed: 10/100/1000 Mbps
- Mounting: DIN-rail
- Input voltage: 9-60VDC (may vary by model)
- Port Options: 2, 3, 5, 7, 8, 9, 10, 16 or 18
- Maximum fiber ports: 2/Maximum PoE ports: 4

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### MACH104 with PoE Plus Ports and Layer 3 functionality

**Belden/Hirschmann**

The MACH100 family of 19” rack mount Industrial Workgroup Switches offers the quality that customers expect from Hirschmann – designed for control room and light industrial applications.

- Static and dynamic unicast routing as well as multicast routing allow subnetworks to be set up and linked together
- Technologies such as PoE+ and PTPv2 facilitate a wide range of possible applications
- Fanless operation
- Supports ACA21-USB automatic configuration adapter
- Available with redundant power inputs
- Supports multiple network redundancy protocols including MRP and RSTP
- Fixed or modular port configurations with 10/100Mbps and all gigabit variants; 8 to 26 ports

### Lite Managed Industrial Switch - GECKO 4TX

**Belden/Hirschmann**

The new GECKO 4TX industrial Ethernet switch guarantees reliable data communication and enhanced redundancy and diagnostic features. It also offers easy-to-implement management functionality at an outstanding price-performance ratio.

- SNMP and HiDiscovery/Industrial HiVision, plus a web interface, ensure fast and convenient administration
- RSTP guarantees reliable data communication
- Longer machine uptime due to simple installation and commissioning
- A range of diagnostic functions ensures fast identification of errors, resulting in smooth production processes

### Hardened managed RSP family for increased security and seamless redundancy

**Belden/Hirschmann**

The RSP switches with robust hardware and a powerful operating system are able to withstand extremely harsh environmental conditions. With HiOS is a new operating system available that will set a new benchmark in the automation sector and further extend the range of applications for the Industrial Ethernet switches.

- Option “0ms” recovery (PRP, HSR) and Fast MRP
- Maximum security, precise time stamping IEEE1588v2, up to 3x GE ports, plus 8 FE ports
- The Layer 3 version offers full wired speed IPv4 routing with lowest latency
- Future-proof design and best-possible investment protection thanks to the maximum flexibility provided by the media modules

### RS and MS Managed Industrial Ethernet Switches

**Belden/Hirschmann**

Hirschmann's RS, RSB and MS (MICE) families of industrial managed Ethernet switches set the standard by which other switches are measured. Engineered and manufactured for highest reliability and flexible configuration. The RS20/RS30/RS40 families feature a compact form factor whereas the MS20/MS30 feature a modular form factor with hot-swappable media modules.

- 4 to 26 ports, copper or fiber, gigabit and PoE
- Enhanced or Professional firmware
- DIN rail mounted
- PLC integration via Ethernet/IP or PROFINET

### OZD Fiber Transceivers/ Modems

**Belden/Hirschmann**

FiberINTERFACES makes it possible to transmit industrial data over several miles/kilometers. They connect terminal devices such as computers, HMLs, programmable logic controllers (PLCs) and peripheral devices together. Hirschmann’s OZD fiber transceivers support protocols including Profibus, Modbus+, Geniusbus, WorldFIP and RS 485 in drop and ring topologies. Ethernet transceivers are also available.
INDUSTRIAL ETHERNET continued

MSP family - Managed Modular DIN Rail Mount Switches with various security features
Belden/Hirschmann
A variety of security functions combined with innovative redundancy protocols make this modular switch the most powerful Industrial Ethernet System for DIN Rails. Thanks to PoE plus support, terminal equipment can also be powered Cost-effectively. The MSP Layer 3 software brings routing to the shop floor and enables communication between physically separated networks.

- Layer 3 capability brings routing to the shop floor and enables communication between physically separated networks
- Unique security functions set standards for network availability
- Modular design allows flexible and cost-effective solutions

Rugged Substation - Grade Ethernet Switches
Belden/Hirschmann
The MACH1000 and RSR families of rugged substation (IEC 61850) Ethernet switches offer excellent RFI/EMI shielding under extreme conditions (-40°C to +85°C) and great flexibility (up to 5 different port types available on one switch!) The switches are virtually indestructible and offer the same excellent quality which users have learned to expect from Hirschmann. MACH1000 offers rack-mounting (26 ports max; front or rear facing) whereas the RSR offers DIN-rail mounting (10 ports max) – both have gigabit options available.

- New added features such as PoE, PTP and L3.
- Applications include: substations, transportation automation, military, railroad optical networks and military.

MACH4000 Industrial Ethernet Switches/Routers
Belden/Hirschmann
The MACH4000 backbone switch is real all-rounder (layer 2 switch or layer 3 router) and suits all applications, especially large networks, with several choices of media modules and high port density.

- Up to 48 Gigabit ports + 3 10-Gigabit uplink ports
- Four 8 port hot-swappable media modules (10/100/1000Mbps)
- Power over Ethernet (PoE) available
- Power redundancy options
- Quad-redundant fan
- Supports ACA-21 USB automatic configuration adapter

OCTOPUS Wash Down/IP67 Industrial Ethernet Switches
Belden/Hirschmann
Dirt, water, vibration, temperature fluctuations and other critical environmental conditions at the field level? Hirschmann’s OCTOPUS Ethernet switch family is prepared for extreme conditions! It has a washdown (IP67), outdoor-duty housing utilizing M12 ports for superior resiliency. Options include managed or unmanaged, 5 to 24 ports, fiber gigabit uplinks and Power over Ethernet (PoE). Applications include automotive, rail, shipboard, security and factory automation.

- Compact IP67/65/54 metal housing with high port density
- Gigabit and Fast Ethernet connections for twisted pair and fiber-optic cable
- Fast Ethernet ports for PoE or PoE Plus

EAGLE Firewall/VPN Ethernet Security Appliance
Belden/Hirschmann
EAGLE One: Industrial firewall providing Stateful Packet Inspection (SPI) for bridged or routed communication combined with a unique Firewall Learning Mode and comprehensive Network Address Translation (NAT) techniques and VPN functions. EAGLE20-0400 and EAGLE30-0402: Multi-port Stateful Packet Inspection (SPI) firewalls in convection-cooled metal DIN Rail housings which support 6 LAN ports – two of which are Gigabit and two SHDSL ports.

- Ethernet in the First Mile (EFM) through newly added SHDSL-Interfaces
- Transmission rates and standards supported are 100 Mb/s, 1 Gb/s, Ethernet, SHDSL
- Includes router redundancy for reduced downtime – VRRP
- Redundant backbone connections for production cells
- Firewall Learning Mode for easy and smooth commissioning
- Stateful inspection firewalling and NAT techniques for routed traffic

Industrial Ethernet Accessories
Belden/Hirschmann
Hirschmann offers a variety of accessories to support your industrial Ethernet installation:

- ACA31 Auto-configuration adapter, SD card with 512MB, extended temperature range
- ACA21-USB (for all Hirschmann-managed switches except RSB): Automatic configuration adapter for rapid switch replacement
- ACA11: (RSB switches) Automatic configuration adapter power supplies
- SFPs (Small Form Pluggable transceivers) for Gigabit fiber networks
MTL4500 Series Intrinsically safe isolators with PLC/DCS Backplane solutions

MTL Instruments

MTL provides customized backplane solutions for the major DCS/PLC manufacturers. These include Schneider Modicon, Rockwell Automation ControlLogix, Siemens S7, Invensys, ABB, Honeywell, Yokogawa, HIMA and others.

- 3 Port isolation as standard
- Highest module/channel packing densities
- Low Power dissipation
- Quick install and release mechanism
- Multi channel I/O modules
- Broken line and earth fault protection
- Compatible with preceding MTL isolators series for pluggable replacement

MTL 5500 / 7700 Series I.S. Isolators & Barriers for DIN rail mounting

MTL Instruments

MTL Isolators and Barriers clamp simply and securely onto standard T-section DIN rail, simultaneously making a reliable IS earth connection. Removable terminals are used for ease of installation, maintenance and for providing a loop disconnect by simply unplugging the terminals from the side of the module.

- Removable terminals
- Bussed power feed to other modules
- Proximity detector inputs
- Electronic fusing
- Compatible terminal numbering and safety descriptions

MTL 9460-ET Series Intrinsically safe ethernet solution

MTL Instruments

- Cost effective IS Ethernet equipment or Zone 1, Division 1 hazardous areas
- Connectivity into Zone 0
- Intrinsically safe Power over Ethernet (PoEx™) enables live connection or disconnection in Zone 0 and 1
- Serial-to-Ethernet Gateway
- Copper to Fibre-Optic Media Converter
- IS Ethernet Switch
- IS Ethernet Isolator
- IS Wireless LAN Access Point/Bridge

MTL9189 Series 8 segment redundant fieldbus power supply

MTL Instruments

The 9189 fieldbus power system is designed to provide redundant power for eight, or four, Foundation™ fieldbus H1 segments for use with all fieldbus systems. It is optimized for use in general purpose and hazardous area High Energy Trunk architectures which, with the appropriate FieldPlus wiring components, supports fieldbus devices using all hazardous area protection techniques.

- Redundant fieldbus power for Foundation™ fieldbus cards
- Flexible N+1 redundancy
- Low lifetime costs
- Low capital cost whilst supporting future expansion
- Fully isolated
- Hot swappable power modules
- Low power dissipation
- On-line diagnostics option
- Pluggable trunk surge protection option

Tofino™ - Industrial Security Solution Network protection

MTL Instruments

The Tofino™ Industrial Security System is a new and unique solution from MTL and Byres Security that addresses the important issue of protecting Industrial Networks from malicious or accidental disruptions. Instead of the standard, highly complex, “IT-style” firewall that requires highly trained staff to install it, the Tofino™ appliance only requires a field technician to attach power and two network cables to it and then walk away.

- Industrial network protection
- Automatic device discovery
- Simple installation
- “transparent learning” option
- 10/100Mbs Ethernet
- Power supply redundancy
- Assisted rule generation
- DIN-rail mounting
**Surge Protection Products**

**SPDs for Power Supply Systems**

**Phoenix Contact**

Phoenix Contact offers a wide variety of industrial grade surge protection devices (SPDs) for power systems in multiple voltage and system configurations.

The MAINS PLUGTRAB series offers optimal device protection for sensitive critical system equipment.

The VAL/ETRAB compact series are compact, pluggable SPDs designed to handle up to 40kA, 8/20µs transients. These devices function to prevent harmful transients generated from internal systems such as motors, VFDs, and power company capacitor bank switching.

The VAL–MS–T1/T2 series are pluggable SPDs developed to handle both internally generated transients and lightning induced events. These special proprietary devices utilize powerful MOV suppression elements capable to handle partial lightning currents of up to 12.5kA, 10/350µs and 40kA, 8/20µs transients.

The features include:

- UL 1449 3rd edition recognized
- DIN-rail mountable
- Remote monitoring
- Hot swappable plug eliminates downtime during module replacement
- Extends existing Phoenix Contact product warranties on power supplies, industrial PCs, radios and many other products to an Unconditionally 5 Year Warranty

**COAXTRAB**

**Phoenix Contact**

Phoenix Contact's COAXTRAB offers optimal surge protection for wireless systems exposed to lightning events. The protection of wireless radios, antennas and cables is crucial to increasing system availability and reliable data transmission. Features include:

- Available as CN-UB for DC Pass and CN-LAMBDA for DC Blocking
- DC Pass uses a gas discharge tube that diverts the surge to ground
- DC Blocking uses Quarter wave technology stub which short circuits surge events to ground
- Antenna connections with BNC, N or 7/16 and SMA connectors
- High transmission capacity
- Available from 0 to 6 GHz, For example: 900 MHz, 2.4 GHz and 5.9 GHz.

**PLUGTRAB PT-IQ**

**Phoenix Contact**

Phoenix Contact's PLUGTRAB PT-IQ provides intelligent and systematic surge protection for floating and discrete signals. This solution is excellent for projects in instrumentation and control applications with numerous signal interfaces for measurement and control technology that need maximum availability. Features include:

- UL Listed
- Three stage indication
- Preventative function monitoring
- Extension up to 28 SPDs via DIN rail connector
- Variable connection technology

**Protection Made Simple UL Applications**

**Eaton's Bussmann business**


- Rated and tested as a Type 2 Component Assembly for easy of application in UL 508A panels
- DIN-Rail design with replaceable modules and rejection feature makes it easy to identify, install and maintain
- SPD devices with high SCCR covering all United States and Canadian markets
- Vibration and shock resistant according to EN 60068-2 standards

**Surge Protection for Low Voltage Automation and Control Applications**

**Eaton's Bussmann business**

Efficient and reliable network protection for low voltage and telecommunication applications.

- DIN-Rail design with rejection feature makes it easy to identify, install and maintain
- High surge discharge capacity provided by combination of gas discharge tubes and heavy-duty metal oxide varistors
- easyID™ visual indication and optional remote contact signaling make status monitoring simple.
- Vibration and shock resistant according to EN 60068-2 standards.
- Energy coordination with other Eaton's Bussmann business DIN rail surge protection devices.
Surge Protection for Data Signal

**Eaton’s Bussmann business**

Complete data signal surge protection for telecom and instrumentation applications.

- UL 497B Listed to protect equipment and wiring against the effects of BNC Coax Cable, RJ45 Ethernet Data Cable and Universal 4-Pole versions available for popular data signal applications
- DIN-Rail mount makes installation easy
- Universal 4-Pole SPD is easy to apply in most instrumentation applications up to 180V
- Data signal SPDs complement SurgePOD™ Type 1 and DIN-Rail UL/Low Voltage surge product lines for comprehensive system overvoltage protection

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**SurgePOD™ HEAVY DUTY SPDs**

**Eaton’s Bussmann business**

Robust Type 1 SPDs provide ultimate surge protection for critical commercial and industrial applications.

- Type 1 UL 1449 3rd Edition Listed SPDs are easily selected and installed on the loadside or lineside of the service entrance overcurrent protective device
- Patented Bussmann SurgePOD™ module technology eliminates the need for additional fusing
- Voltage specific models precisely match and protect electrical systems and equipment up to 600Vac
- Compact UV resistant NEMA 4X for indoor or outdoor applications
- easyID™ LED status indicator provides surge protection status at a glance

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**BSPD Family SPDs**

**Eaton’s Bussmann business**

Delivers reliable surge protection with high surge current capacity for system switchgear and power distribution panels.

- 120kA to 400kA surge current capacity ratings (Imax) meet the requirements of larger switchboards and electrical panels
- UL maximum 20kA nominal discharge current rating (In) and 200kA SCCR meet many system requirements
- easyID™ LED status indicators provide surge protection at a glance.
- Available Form C contact, EMI/RFI filtering and surge counter options to meet specific application requirements

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**Power Distribution Fuse Block**

**Eaton’s Bussmann business**

New Class J fuse blocks with power distribution capability save space, time and money.

- Combination power distribution block and fuse block reduces wire connections and total panel components, using up to 50% less panel space and reducing installation time and labor by 33% when compared with traditional solutions
- 200kA withstand rating helps achieve a higher assembly SCCR for compliance with NEC®
- Optional see-through cover enhances safety with IP20 finger-safe protection, lockout/tagout capability and open circuit indication

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**Fuses Made Simple**

**Eaton’s Bussmann business**

The easiest and fastest way to select and specify the right branch circuit fuse.

- Three tiers of protection offer distinct levels of performance benefits to help speed up specification and selection (Ultimate Protection, Advanced Protection and Basic Protection)
- Inside these three protection tiers are four distinct families – Low-Peak™, FUSETRON, Limitron and General Purpose – each represented by a unique color for their key protection and performance benefits

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**Fuses Made Simple – Control Circuit Fuses**

**Eaton’s Bussmann business**

The easiest and fastest way to select and specify the right control circuit fuse.

- Because the physical size of control circuit fuses does not vary with voltage ratings, the most frequent cause of misapplication is due to improper voltage selection
- Now, there are six voltage-based color codes to help make it easy to identify the right fuse
- Each fuse label has a unique identifying color band that represents the fuse’s maximum voltage rating, making selection easy, replacement simple, and enhances the safety of the entire system
**Phaseo Power Supplies**

**Schneider Electric**

With dual upstream/downstream display for quick diagnostics and an output voltage that can be adjusted to compensate for voltage drops on the line and protection against overloads and short-circuits, the range of Phaseo power supplies is quite simply efficient. Designed to supply the voltage required for control and power circuits of automation system equipment from 0.3 to 40 A. Rectified and filtered power supplies are available for applications which accept fluctuations in the power supply of + or - 10% and transformers, for converting a 400 V to an AC voltage between 24 V and 230 V. The wide range of input voltages ensures simplicity of choice due to fewer product references.

**Phaseo Dedicated Power Supplies**

**Schneider Electric**

The perfect solution for simple power supply needs!

- Output current of 2.5 A to 10 A, and output voltage of 12 and 24Vdc
- Designed for simple and repetitive machines
- Simple range, high quality, competitive
- Perfect integration in enclosures

**Phaseo Optimum & Universal Power Supplies**

**Schneider Electric**

Bring energy to your automated systems!

**Modular and optimum power supplies for 100-240 V single-phase networks**

- Output voltage: 5, 12, 24, 48 V -7 W-145 W
- Highly compact size
- Wide voltage range
  - Fixing by screw or on omega rail
**Universal power supplies, for networks single/3-phase 100-500 V**

- Output voltage: 24 V and 5 to 15 V by converter modules 48 V/72 W-960 W
- Integrated energy reserve
- 6 product references from 3 A to 40 A
- Fixing on omega rail
- Advanced diagnostics by LED and relay contact
- Integrated anti-harmonics filter
- Function modules to respond to problems of network cuts, 24 VDC circuit overloads and availability

**Industrial 84 to 960 Watt**

**Phoenix Contact**

QUINT SFB DIN-rail power supply family is the premier product offering for demanding applications and harsh environments. The QUINT SFB has the unmatched SFB (selective fuse breaking) technology that provides a current reserve large enough to trip Thermal Magnetic Breakers quickly and reliably. This allows the breaker to trip off without bringing down the DC bus. The QUINT SFB also carries advanced diagnostics providing both local and remote indication of when the DC output is "OK," in "Power Boost" mode or in an overload condition. This provides additional notification to the condition of the DC bus to maintenance personnel. The QUINT SFB is also among the smallest power supplies of its class with the three-phase, 40A power supply only measuring 96 mm (3.78 inches) wide.

**Industrial 15 to 100 Watt**

**Phoenix Contact**

The MINI DIN-rail Power supplies offer a robust power supply in a small package. These MINIs offer Power Boost and Remote Diagnostics providing fully featured power supplies. The MINI power supplies are available in lower current ranges and specialty configuration that are ideal for small applications that demand high performance. In applications such as remote monitoring, wireless radios and other measurement/monitoring uses, the MINI is ideal.

**60 to 960 Watts, Basic Functionality**

**Phoenix Contact**

The TRIO family of DIN-rail power supplies is a rugged “general purpose” power supply. This family is a cost effective solution where high wattage power supplies are required. The TRIO power supply features a "fold-forward" output characteristic that prevents the power supplies from tripping off in the event of a high power demand from the load. They also feature a wide adjustable output range to suit a wide application set.

**UNO Power Supplies**

**Phoenix Contact**

25-240 Watts

Value powered reliability.

The UNO Power supply units offer basic functionality for 5, 12, 15, 24 & 48 VDC applications. Variants for UL1310 listed NEC Class 2 applications are also available.
12 to 100 Watts, Basic Functionality

Phoenix Contact

STEP, DIN-rail power supplies are an ideal product range for low wattage outputs and a small form factor. The STEP family is only 41 mm (1.61 inches) deep making it perfect for the small distributed control cabinets. The mounting feet of the STEP allows for either DIN rail or panel mount. This allows the power supply to be used in almost any installation scenario and perfect for building automation. Some of the power supplies also feature adjustable output voltages that allow for compensation for line resistance. A selection of STEP Power supplies are also approved to UL/IEC 60601-1 3rd Edition for medical applications.

Industrial UPS Systems

Phoenix Contact

The new QUINT IQ DIN-rail UPS technology allows for a UPS to closely monitor a scalable battery solution. The QUINT IQ solution uses intelligent battery modules to answer common application questions that include: A display for level of battery charge, knowing how long the backup time will last and knowing when the battery should be replaced.

The UPS systems are available in 24V, 5A, 10A, 20A and 40 amp versions. There is also a 500VA version. Battery modules range in size from 1.3AH to 38AH. The battery modules are “hot swappable” with easy front panel access for maintenance.

Additional features include: event logging, e-mail alarms, configurable status contacts, industrial approvals and PC shut-down and re-start functionality.

Industrial Network

Uninterruptible Power Supply (UPS)

Panduit

The Panduit Industrial Network UPS uses ultracapacitor technology instead of batteries, eliminating the number one cause of conventional UPS failures, which lowers the risk of downtime. The no battery design is maintenance-free, providing 2X greater ROI and 50~70% lower cost of ownership than an ordinary UPS. Remote device management uses standard web browsers, saving time and money on proprietary software.

AC DRIVES AND SOFT STARTS

VARIABLE-TORQUE APPLICATIONS

Altivar 212 Mid-featured AC Drives

Schneider Electric

Offering unmatched value in installed cost and functionality for HVAC equipment, the Altivar 212 allows original equipment manufacturers and control panel builders to focus on the essentials.

This economical drive reduces energy costs by adjusting motor speed to the required flow of air or fluids. It can also lower your installation costs by eliminating throttling valves, dampers or inlet guide vanes typically used to control the flow of fluids. In addition, building occupant comfort is maximized with accurate flow control.

Altivar 61 Full-featured AC Drives

Schneider Electric

The Altivar 61 offers a wide range of functions for centrifugal pumps and fans from 1 to 900 HP. Its evolutionary design meets your requirements to manage and monitor your building’s HVAC and pumping functions.

The Altivar 61 drive reduces energy costs by adjusting motor speed to the required flow of fluids. It will also lower installation costs by eliminating throttling values, dampers or inlet guide vanes typically used to control the flow of fluids. In addition, building occupant comfort is maximized with accurate flow control.

Altivar 71 Full-featured AC Drives

Schneider Electric

The Altivar 71 is a high-end AC drive for constant torque applications using three-phase motors from 0.5 to 100 HP at 208/230 VAC and 1 - 700 HP at 380/460 VAC. The Altivar 71 defines ease of use for variable speed AC drives and simplifies complex applications with customizable capability. Reliable, expandable and easy to control, it saves time and money for machine builders, panel builders and system integrators.
Altivar 312 Mini-drives
Schneider Electric
The Altivar 312 is designed to make industrial and commercial machines more efficient while at the same time, simplifying its integration into a single control system architecture. With the highest overtorque and the only drive with a remote graphic keypad in its class, the Altivar 312 is ideally suited for a variety of machines.

Altivar 32 Mid-featured AC Drives
Schneider Electric
The Altivar 32 variable speed drive’s slim, book-style footprint, side-by-side mounting capability and ability to accept a self-protected disconnect reduces panel space and wiring costs. It also has certified safety functions for safe power removal, safe limited speed and safe stopping, as well as integrated decision capabilities such as input/output (I/O) event logic, counting and timing functions.
It delivers exceptional speed and torque control for asynchronous or synchronous AC motors to maximize your machine’s performance. It also provides other innovative features such as Bluetooth connectivity, integrated logic, quick wiring adapters and conformal coating to protect circuit boards from dust, moisture and other airborne contaminants, which allows it to be used in harsh environments.

Altistart 01 Soft Start
Schneider Electric
Altistart 01 soft start (ATS01) provides torque surge suppression during starting and stopping operations for single-phase and three-phase asynchronous motors rated from 3 to 85 amps (110 to 575 volts). This new, feature-rich mini soft start offers customers a solid-state alternative to low horsepower electromechanical reduced voltage starters.
As one of the smallest soft starts on the market, most ATS01 soft starts are only 45 mm wide to line up with IEC motor starters and eliminate wasted space. Designed for side-by-side mounting, it requires 25% less panel space. Installation is simplified with DIN rail or panel mounting, a removable control wiring terminal, contactor-style power wiring and a custom ATS01 to TeSys U Line Motor Starter power connector.

Altistart 22 Soft Start
Motor Controller
Schneider Electric
Focus on savings and safety in your installations - Up to 50% reduction in wiring time.
A mid-range soft start designed for 3-phase motors rated 17 to 590 A, 3 to 500 hp. For commercial and light duty industrial applications.
The Altistart 22 soft start offers such standard features as:
- Reduces your operating costs
- Simplifies wiring
- Protects your electrical installation
- Saves space with a fully equipped product
- Integrates bypass and protection functions

Altistart 48 Soft Start
Schneider Electric
The Altistart 48 (ATS48) soft start features a patented advanced motor control algorithm called TCS or Torque Control System. Without speed feedback, the ATS48 soft start provides constant starting and stopping rates independent of motor loading, just like a more expensive AC drive. Setting the new industry standard for soft starts, the ATS48 controls the applied motor torque, making it ideal for a wider variety of applications than a traditional voltage ramp soft start with the current limit. In pumping applications, the ATS48 with TCS eliminates the long start and stop times, the hydraulic transients and slamming of check valves associated with “pump version” voltage ramp soft starts.
ENCLOSED DRIVES AND SOFT STARTS

Enclosed Altistart 22 Soft Start
Schneider Electric
The Enclosed Altistart 22 solid-state combination motor controllers provide a pre-engineered, integrated solution for reduced voltage starting and soft stopping of standard three-phase asynchronous induction (squirrel cage) motors. The enclosed controllers consist of a circuit breaker disconnect and an Altistart 22 soft starter in a stand-alone enclosure.

Enclosed 48 Soft Start
Schneider Electric
The range of Enclosed ATS48 soft starts packages the advanced functionality of the Altistart 48 soft start in Type 1, Type 12 or Type 3R enclosures to provide industry-leading performance in a packaged solution. Available as a pre-engineered and “build-to-order” product, Enclosed ATS48 soft starts can be configured based upon exact specifications to optimize the unit for specific application requirements up to 600HP.

Combination devices are available with either a circuit breaker or fusible disconnect, the Enclosed ATS48 features coordinated short circuit current ratings up to 100kA (fused) and 30kA (circuit breaker) and is rated as seismic qualified (floor mount configurations) to International Code Counsel Evaluation Service (ICC ES) Acceptance Criteria for Seismic Qualification Testing of Nonstructural Components (AC156).

MCC Enclosed Soft Start
Schneider Electric
Motor Control Center (MCC) Soft Start product offer provides a pre-engineered, integrated package consisting of a combination disconnect and soft start controller for reduced voltage starting. Seismic ratings in accordance with industry standards are available.

Options include circuit breaker or fused disconnect, input isolation contactor, reversing, full voltage bypass, IEC or NEMA-rated contactors and severe duty ratings.

E-Flex Enclosed AC Drive Controller
Schneider Electric
The Square D by Schneider Electric brand E-Flex enclosed AC drive is a robust, industrial-grade solution for healthcare and industrial plant floor, pump and fan applications. The E-Flex enclosed drive features the Altivar 61 AC drive on the inside and provides 100 kAIC rating with a circuit breaker and with an option for bypass contactors. Built to conform to international building code (IBC) and ASCE seismic standards for ground and roof-level installations, the E-Flex enclosed drive meets both indoor and outdoor application requirements with Type 1, Type 12/12K and Type 3R enclosures.

The S-Flex Enclosed Altivar 212
Schneider Electric
The Square D branded S-Flex 212 enclosed drive:
- Provides the right features for HVAC pump fan applications
- Offers unmatched value in installed cost and functionality
- Allows building owners, consulting engineers and contractors to focus on the essentials for commercial building applications

S-Flex 21 enclosed drive provides energy savings by reducing motor speed and electricity usage for a quick return on investment.

Enclosed ATV61 or ATV71 (M-Flex)
Schneider Electric
Featuring the new Altivar 61/71 adjustable frequency power converters, the M-Flex enclosed drive controller offers a platform of standard, engineered and special features to meet the varied needs of commercial, industrial and municipal process applications where high functionality of features is required.

Enclosed 48 Soft Start
Schneider Electric
The range of Enclosed ATS48 soft starts packages the advanced functionality of the Altistart 48 soft start in Type 1, Type 12 or Type 3R enclosures to provide industry-leading performance in a packaged solution. Available as a pre-engineered and “build-to-order” product, Enclosed ATS48 soft starts can be configured based upon exact specifications to optimize the unit for specific application requirements up to 600HP.

Combination devices are available with either a circuit breaker or fusible disconnect, the Enclosed ATS48 features coordinated short circuit current ratings up to 100kA (fused) and 30kA (circuit breaker) and is rated as seismic qualified (floor mount configurations) to International Code Counsel Evaluation Service (ICC ES) Acceptance Criteria for Seismic Qualification Testing of Nonstructural Components (AC156).

PowerGard 18-Pulse Enclosed Drives
Schneider Electric
For municipal and industrial pumping applications, the Square D brand PowerGard Series C 18-Pulse enclosed drive controller features the new Telemecanique brand Altivar 61 and 71 adjustable frequency drives/power converters. Schneider Electric's experience and expertise in power distribution and power quality measurement are combined with solid state motor control. The result: A robust, packaged, adjustable speed drive with clean power solution.
End User Solutions
Graybar supplies products, services and technical expertise to end-user and OEM customers.

OEM/Panel Builder Solutions

What can we do for you?
Engage with Graybar’s industrial sales specialists anywhere in the nation and see how our solutions can work to your advantage.

Find out more about how we can help you in your industry:
- Automotive
- Chemical Processing
- Electrical Equipment
- Food and Beverage
- Heavy Manufacturing
- Machine Builder
- Metals
- Mining
- Oil and Gas
- Panel Builder
- Pharmaceutical and Biotech
- Power Generation
- Printing and Publishing
- Pulp and Paper
- Water and Wastewater
**OsiSense XML Electronic Pressure Sensors**

*Schneider Electric*

XML pressure switches have been designed to control or regulate pressure in fluid, water and hydraulic or pneumatic systems. They are completely programmable with 10 million-cycle operation.

**OsiSense XS Inductive Proximity Sensors**

*Schneider Electric*

The XS line of inductive proximity sensors provides a single-product solution for any metal environment. Out of the box, the proximity sensor is unshielded. However, by simply pressing one button, you can teach the sensor to ignore surrounding metal and even metal behind a metal target. A second precision setting narrows the field to mere millimeters.

**OsiSense XU Photoelectric Sensors**

*Schneider Electric*

A simple product for all detection applications. Self-adapts to all applications and environments.

**OsiSense XC Limit Switches**

*Schneider Electric*

These miniature limit switches provide modularity of connection. This translates into improved machine availability.

**Pressure Sensors and Switches**

*Telemecanique Sensors*

OsiSense XM and Square D pressure switches have been designed to control or regulate pressure in fluid, water and hydraulic or pneumatic systems. They are completely programmable with 10 million-cycle operation.

Wide variety of IEC and NEMA pressure and level sensors is the right choice to solve both your simple and complex fluid control applications, with time proven performance.

**Limit Switches**

*Telemecanique Sensors*

OsiSense XC for light to medium duty applications. European IEC standard products (EN50047) have positive opening contacts, even in snap action versions which allow use in safety applications. Square D 9007 series limit switches can withstand the impact of heavy industry. We offer you the most comprehensive offer of NEMA limit switches, rugged and dependable, built with unparalleled quality.

**Proximity Sensors**

*Telemecanique Sensors*

OsiSense XS and OsiSense XX is one of the most comprehensive product lines of inductive and ultrasonic on the market of standard cylindrical forms: M8,12,18, 30 and standard Rectangular and flat forms. Top quality enclosures up to IP69K rating available in standard and increased sensing range with a robust construction for durability in harsh environments.

**Photoelectric Sensors**

*Telemecanique Sensors*

OsiSense XU available in thru-beam, polarized retroreflective, proximity diffuse and diffuse with background suppression. Multi-mode sensors available that can switch between modes by simple programming procedures. Application specific sensors are available for transparent material detection, label sensing, distance measurement, color mark reading, color detection, and a wide range of Fork Sensors.

**Identification**

*Leuze Electronic*

Handheld, fixed-mount and high-speed barcode imaging systems for Data Matrix and common 1- and 2-D barcodes utilizing laser, vision. Line, oscillating-mirror, raster scanners from various sizes, designs with high scanning rates of up to 1000 scans/s, the smallest installation dimensions, robust as well as food grade lens housings and enclosures, integrated heating option for use in low-temperature applications. Superior code reading as well as reconstruction technology for reading damaged codes. Integrated interfaces Ethernet, Ethernet IP, MultiNet Plus, Profinet, PROFIBUS, RS232, RS422 and RS485 interfaces.
Biometric Switch
Schneider Electric
Utilizing fingerprint recognition technology, Harmony Biometric Switch by Schneider Electric is the only industrial switch of its kind to authorize users for operator or equipment usage. As a viable alternative to combat the weaknesses of the other access control systems, the switch provides simple, reliable and efficient operation to restrict access to sensitive zones and machine functions (starting, adjustment, maintenance, etc.) to only authorized personnel, which is essential in industrial environments.

Wireless, Batteryless Push Button
Schneider Electric
Utilizing wireless technology, the Harmony XB5R Wireless, Batteryless push button is easy to install in both new and existing applications, such as bottling, packaging and conveying lines. Now you no longer need to pass a cable through the machine structure or cable tray to connect the push button to the electrical panel – cutting installation costs by 20% as compared to traditional wired solutions.

When the operator pushes the button, mechanical energy is transformed into electrical energy, which sends a one-time radio message to the receiver. The batteryless solution offers permanent availability, benefits the environment and eliminates costly battery maintenance, re-charging and recycling.

The wireless technology helps to achieve greater productivity by providing operators with greater freedom and mobility, allowing them to remotely control machines at a distance of up to 25 meters away in a metal cabinet. Similar to other Harmony products, the wireless, batteryless push button is well-suited for harsh industrial environments where added protection of your people and machines is paramount.

16 mm Push Buttons
Schneider Electric
Harmony XB6 16 mm Push Buttons, selector switches and pilot lights with plastic bezel are intended for machine adjustment and set-up applications, such as conveyor systems and measuring equipment.

22 mm Push Buttons
Schneider Electric
The new XB4 (metal) and XB5 (plastic) range of 22 mm push buttons, selector switches and pilot lights employ exclusive new technology and ergonomic design that simplifies installation, improves aesthetic appearance and revolutionizes maintenance. The XB4 22 mm push buttons have a unique, compact design that requires less panel space and makes installation fast and easy. The use of an innovative locking system – where the body and head clip together and are locked by a single screw – ensures simple and secure mounting.

22 mm Multiple Headed Push Button
Schneider Electric
The Harmony XB4/5 multiple-headed push button provides two or three functions in the same physical space as a single-function device for simple applications. With up to two push buttons and one pilot light available in one 22 mm mounting hole, Harmony multiple-headed push buttons save space and reduce installation costs by using a standardized product.

Metallic XB4 (heavy duty) or Plastic XB5 (harsh environment) operators also help reduce inventory requirements. Instead of stocking a large number of references, you now only need to stock one kind of head and the adapted caps for post customization.

Using super bright and energy-efficient LED technology, these buttons provide high contrast illumination with long-life operation (up to ten years) and additionally feature easily readable, double injection markings for a clear indication of button action. Rated for one million operating cycles, Harmony push buttons are proven to provide highly reliable and durable operation for packaging machinery, material handling conveyors, building automatic doors and more.

30 mm Push Buttons
Schneider Electric
Harmony 9001K and 9001SK push buttons, pilot lights, selector switches and joystick operators are heavy-duty products for heavy-duty applications. Light modules and contact blocks are interchangeable to reduce inventory. Contact blocks can be mounted side-by-side and/or stacked to minimize enclosure space requirements.

- 9001K operators are rugged and chrome-plated for most installations.
- 9001SK operators are black plastic for corrosion-resistant applications.
- 9001XX include square heads and provide multifunction operation.
Unity Pro
Schneider Electric
Unity Pro is the common programming, debugging and operating software for the Modicon Premium, Atrium and Quantum ranges of PLCs. It is based on the standards set by PL7 and Concept software and provides a comprehensive set of new functions for greater productivity and openness to other software. Independent symbolic memory variables, structured data and user function blocks directly reflect the application-specific components of the automated process. Debugging and maintenance functions use simple animated graphic objects. A diagnostic display window provides a clear, chronological display of all system and application faults and a navigation function for finding the fault causes. It traces missing conditions back to the source. The standard XML Web format for data exchange has been adopted as the source format for Unity applications. Schneider Electric takes the time, cost and risk out of upgrading your Modicon PLCs to provide state-of-the-art levels of performance and process visibility. Here is how we make it easy:

- Conduct plant life cycle evaluations to identify areas where upgrading your automation technology can benefit your bottom line
- Enable wiring adapters to connect old field wiring to our latest I/O platforms – a simple plug-and-play proposition.
- Enable the importing of existing LL984 code into Unity Pro software for use in a modern PLC system, minimizing commissioning time and eliminating the need to rewrite code.
- Leverage open-networking standards, such as Ethernet I/P, embedded webbased services and open connectivity with enterprise-wide visualization and business systems.

Concept
Schneider Electric
Concept is the powerful IEC programming software for the Momentum and Quantum range of PLCs. It provides advanced Microsoft Windows-based tools that deliver a multi-language development environment for control system programming. Five IEC editors give users the freedom to choose the programming language that fits their application requirements:

- Function Block Diagram (FBD)
- Ladder Diagram (LD)
- Sequential Function Chart (SFC)
- Structured Text (ST)
- Instruction List (IL)

PowerLogic ION Enterprise V6
Schneider Electric
PowerLogic ION Enterprise software is a complete power management solution for energy providers and industrial or commercial operations. It gives engineering and management personnel the information they need to cut energy-related costs, avoid downtime and optimize equipment utilization.

PowerLogic ION Enterprise helps you track real-time power conditions, analyze power quality and reliability and respond quickly to alarms to avoid critical situations. It helps you study historical trends to reveal energy waste or unused capacity as well as verify efficiency improvements and allocate costs to buildings, departments or processes. The software includes sophisticated load aggregation and arithmetic calculation. Coordinated control capabilities can be used to manage demand or power factor and to manage loads or generators. Customized information is easily seamlessly shared with all stakeholders and with other business and automation systems.

PowerLogic SCADA 7.10
Schneider Electric
PowerLogic SCADA v 7.1 software combines our power monitoring and energy management expertise with industry leading technology for HMI/SCADA application. The results, software that delivers a reliable and high performance monitoring and control solution to industries where reducing outages and increasing power efficiency is critical. PowerLogic SCADA software is designed to meet the user requirements of the most demanding enterprises. Easy-to-use configuration tools enable faster development and deployment of any size application. Also, PowerLogic SCADA software ensures easy system integration through support of modbus communications to any device.

PowerLogic SCADA v 7.1 software delivers a reliable, flexible and high performance monitoring and control solution designed to reduce outages and increase power efficiency. It is built to handle user requirements from the most demanding enterprises, while still providing high performance and reliability. Easy-to-use configuration tools and powerful features enable faster development and deployment of any size application.

PowerLogic SCADA solutions are a complete engineered solution, with all features, protocols and drivers included. As a single, comprehensive package, PowerLogic SCADA software is tightly integrated and built to perform.
PL7
Schneider Electric
PL7 is the common programming, debugging and operating software for Modicon TSX Micro and Premium ranges of PLCs.
PL7 offers 4 IEC languages.
- Instruction List (IL)
- Ladder Diagram (LD)
- Structured Text (ST)
- Sequential Function Chart (SFC)

ProWORX 32
Schneider Electric
ProWORX 32 is a flexible, easy-to-use cross-platform LL984-programming software for Modicon range PLCs. Program Modicon controllers online or offline, manage I/O subsystems and analyze your plant's activity in real-time, all in a familiar Windows environment. ProWORX 32 provides client/server capabilities to organize user-groups and user-rights, store projects centrally and realize office-plant floor bridging. Test projects in the project emulator to ensure that the system will run at peak efficiency.

Factory Cast HMI
Schneider Electric
The Factory Cast HMI module integrates a Web server that acts as a real time PLC data server, allowing information from Modicon Quantum, Premium and Micro PLCs to be displayed in the form of a Web page in standard HTML format. Human Machine Interface (HMI) capabilities such as e-mail, data logging, user-defined web pages and mathematical computations are embedded. The module can also be used in an existing configuration without any modification of the resident program.

Vijeo Citect
Schneider Electric
Vijeo Citect is a part of the fully integrated Schneider Electric automation solution that will help you increase your return on assets by delivering a reliable, flexible and high performance supervisory control and data acquisition system. Easy-to-use configuration tools and powerful features enable you to quickly develop and deploy solutions for any size applications.

Vijeo Historian
Schneider Electric
Comprising Historian and Portal functionality, Vijeo Historian enables you to accurately store data for long-term reporting, while giving you the option of visualizing and accessing the information through the portal, MS Excel, Process Analyst or Reporting Services. Vijeo Historian translates your plant data and makes it available to business users in their applications, helping them drive better business decisions.

SoMachine OEM
Machine Programming Software
Schneider Electric
Get to market 25%-40% faster with ONE software environment: one software, one project file, one connection, one download.

Offering 100% flexibility and optimization, SoMachine software allows the OEM to design, commission and service machines in a single software suite, resulting in a significant competitive advantage.

Decrease total machine cost using a single environment.
- Install all components in one step
- One software for controllers, HMI and remote devices
- Access to networked devices in pure transparency
- Connect your cable only once and download in one click
- Reduce your programming time!

Industrial HiVision
Network Management Software
Belden/Hirschmann
Network visibility equals high availability. Hirschmann's Industrial HiVision (IHV) is ideal for configuring and supervising all Hirschmann manageable devices, including switches, routers, firewalls and wireless devices. Designed for effective industrial supervision, IHV can be easily integrated into SCADA applications via OPC or ActiveX.

- Network topology is automatically recognized and accurately visualized, including any unmanaged switches and hubs
- Color-coded status displays provide information at a glance
- Using MultiConfig™, hundreds of devices can be configured simultaneously – both when commissioning the system and during subsequent live operation
- All SNMP-enabled devices can be integrated into the management system, including any device-specific properties
- Comprehensive asset management and documentation
- Client/server architecture supporting multiple clients simultaneously
- Distributed network management with hierarchical domain structure
- SNMP/OPC server for integration into SCADA applications
- Graphical user interface available as an ActiveX control
- Setup wizard makes it easy to set up the network management and – if necessary – quickly adjust its configuration
- User interface supports numerous languages
- Versions available for Windows and Linux operating systems
- Free 30-day trial
MACHINE SAFETY

Preventa Machine Safety
Schneider Electric
Preventa Machine Safety solutions provide protection in all the safety functions of your automation system. Solutions that are both approved by and conform to international standards.

Preventa XPSMF Safety PLCs
Schneider Electric
The XPSMF Safety PLCs are programmable safety systems that can be interfaced to the various safety controls in a control system for machinery and equipment. All the XPSMF Safety PLCs are tested and certified by TÜV, regarding the functional safety in accordance to the European Regulations and meet the requirements of EN/IEC 61508 up to SIL 3, and EN 954-1 up to Category 4 and meet up to performance level ‘e’ of the new EN ISO 13849-1.

Preventa XPSMC Safety Controllers
Schneider Electric
The XPSMC safety controllers can be used for monitoring all of the different safety tasks for your applications in one safety controller. The associated configuration software makes development of the safety solution simple, using drag and drop techniques to configure the safety system. Detailed diagnostics provides an in-depth overview of the status of the inputs and outputs and identifies any faults and the cause. XPSMC16Z and XPSMC32Z safety controllers conform to category 4 per EN 954-1 and SIL 3 per IEC 61508.

Preventa XPS Safety Relays
Schneider Electric
The XPS is a new generation of Telemecanique brand safety relays which gives users increased functionality and flexibility when designing equipment to meet safety requirements and standards in the U.S., for the European Machinery Safety Directive and IEC safety requirements.

Universal Safety Relays
Phoenix Contact
Phoenix Contact Safety relays are rated up to SIL 3 per IEC 61508 for low and high demand in the process industry and up to PLe per ISO 13849-1 for machine safety. Phoenix offers relays for e-stop, doors, light curtains and two hand control applications. The PSR Safe Motion controller has safe relay outputs to detect downtime and to monitor maximum speed. Drive motions are either measured by the existing measuring system, such as an encoder, or by two proximity switches. The sensors are connected to the measuring systems using conventional RJ 45 cable adapters.

PSR-TRISAFE and SAFETYBRIDGE Technology
Phoenix Contact
With functionality that’s one step above a safety relay and one step below a safety-rated PLC, the PSR-TRISAFE and SafetyBridge Technology from Phoenix contact are ideal for applications using multiple standard safety relays or for applications that need advanced or unique safety functionality.

The PSR-Trisafe is a stand alone configurable safety relay. The base module comes with 20 safety inputs, 4 safe solid state outputs, and 4 monitoring outputs. Both solid state and relay expansion relays are available and are easily connected via a T-bus connection.

SafetyBridge Technology is a configurable distributed safety system. Safety processors are located in a logical safety I/O block, which communicates on the standard automation network using function blocks on the standard PLC. Up to 16 safe input and output modules can be controlled by the logical block anywhere on the network and up to 31 logic modules can be used on a single PLC. Using this technology gives similar functionality to a safety-rated PLC at a fraction of the price.

Both PSR-Trisafe and SafetyBridge technology are configured with simple with SAFECONF software, which is available as a free download and doesn't require any licensing fees. The software's Simulation Mode can be used to verify a safety project without connecting to any hardware.
Safety Relays

**ABB JOKAB SAFETY**

Offer the most flexibility of any safety relays on the market. Our universal safety relays offer various input options for use with many different safety devices and risk levels. In addition, our safety relays have detachable connector blocks for ease of installation and testing. Internally, our relays offer the highest safety level (Category 4 according to EN-954-1).

RT Series consists of universal relays that have the most common functions used in safety situations.

JSB Series consists of relays for two-hand devices dual input channel synchronization (0.5s - 1.5s) and also a small single channel relay for 12VDC.

Expansion relays are used for expanding the outputs of safety relays. Stop signals can be delayed and outputs are also provided for function indication.

Safety timers are used for time reset, time bypassing and inching.

Non-Contact Switches

**ABB JOKAB SAFETY**

Sense Non-Contact Switches have a compact robust fitting suitable for all guard applications. With a wide 10mm-14mm sensing area, LED indication, and hygienic screw cover options they are suitable for Food Processing washdown applications.

Eden is a non-contact, non-magnetic sensor using dynamic signal transmission and offers Category 4 safety level. Eden (Adam/Eva) has built-in diagnostics and maximum sensing distance of 15mm +/- 2mm. Up to 30 Eden can be connected together in the same circuit and be dynamically monitored by the Vital Safety Module.

Eden E manages harsh environments — e.g. high-pressure wash-down and high and low temperatures (tested from +100°C to -70°C according to IP69K).

Safety Mats and Edges

**ABB JOKAB SAFETY**

The Safety Mat is used for safeguarding sections in hazardous areas around machines, presses, robots and other types of active equipment. Mats are available both with and without integrated trim. When connected to a suitable monitoring system stepping on the mat surface triggers a control signal to the stop circuit of the potentially hazardous motion. This fast contact occurs due to the area switch design on the inside of the mat.

Safety Contact Edges are used as protection against crushing injuries, for example, moving machine parts, and automatic doors.

Light Curtains and Grids

**ABB JOKAB SAFETY**

Orion Safety Light Curtains reduce complexity, speed up installation, reduce downtime and reduce overall project costs. With optional integrated functions such as blanking, beam coding, external device monitoring, local reset, muting and cascading you only have to purchase the feature packs you need. The built in LED alignment aid showing complete signal strength speeds up installation you costs. Orion offers preventative maintenance for lens contamination and signal loss to help reduce machine down time. The Orion family of safety light curtains have been designed to offer the level of safety you need but at a price that helps you remain competitive in a global market.

Pluto

**ABB JOKAB SAFETY**

Pluto is an “All-Supervisor” Safety PLC concept that simplifies the design of safety systems and achieves the highest safety (Category 4) according to ISO13849-1 and SIL 3 according to EN 61508. The power of Pluto is you can do much more with less saving overall project costs. With its dynamic signal technology up to 10 devices can be connected to a single I/O compared to 20 I/O using competitor dual channel technologies. The program is achieved through the no cost Pluto Manager which utilizes simple ladder logic and function block libraries. Through the ABB Jokab Safety Gateway family, all the I/O can be shared to your standard communication protocol.

Two-Hand Control Devices

**ABB JOKAB SAFETY**

Safeball™ is a unique new control approach to the design of one and two-hand control devices. The device meets the highest safety standard and, used in conjunction with the JSBR4 safety relay, meets category IIC according to EN574 safety Category 4. A stop signal is given by the JSBR4 as soon as one or both of the buttons on a Safeball are released. A safety relay or Pluto Safety PLC will also check that all four buttons have been released and that they are activated within 0.5 seconds of each other. In addition, no top shroud protection is required.

The ergonomic design is suitable for all hand sizes and provides varied gripping possibilities.

ABB JOKAB SAFETY has also developed and included in our range of products a traditional two-hand control device, the JSTD20 with optional floor mount.
Fence Guarding
ABB JOKAB SAFETY
Quick-Guard® is an exclusive modular fencing system utilizing aluminum profiles, patented brackets and mesh, solid or noise reduction panels. Thanks to our patented screw-lock system, we supply all brackets pre-mounted with fixing screws and nuts. Quick-Guard E is based upon a new patent pending 'net-lock' which easily locks the mesh against a fence post. No top or bottom horizontal members are needed. The mesh can easily be cut to different heights and it is easy to make openings where desired. All mesh edges are covered with a specially designed ‘u-profile’.

Our SafeCAD® design program, which is based on AutoCad®, makes it simple to build custom fencing solutions. As input, a simple sketch of the required guarding system is used. Position of doors and hatches, as well as choice of infill panels is entered. The program automatically generates 3-D assembly drawings along with component and cutting lists, shipping weight and assembly time.

Vital
ABB JOKAB SAFETY
Vital is the heart of a solution which makes it possible to install/connect many different types of safety devices in the same safety circuit and still achieve PL e according to EN ISO 13849-1 Safety Category 4.

The Vital module is based upon a dynamic single channel concept as opposed to conventional dual channel safety relays. Up to 30 dynamic sensors can be connected directly in the safety circuit and be supervised by only one Vital module. The Vital therefore replaces several safety relays. Safety components with output contacts can be connected to the Vital via low cost Tina adapters.

The Tina devices adapt safety sensors with mechanical contacts, such as emergency stops, switches and light grids/curtains with dual transistor outputs to the dynamic safety circuit in Vital and Pluto.

The Vital also has automatically or manually supervised reset selection, dual safety outputs and an information output for reset indication and status information for PLCs.

Magne
ABB JOKAB SAFETY
ABB JOKAB SAFETY has introduced a new electrical magnet, Magne, developed for process control safety applications when used in combination with the Eden door monitoring switch.

Included in the Magne is an information output contact which indicates that the holding force has reached the level needed. This allows the ability to supervise that the Magne is mounted correctly and that there is nothing between the magnet and the holding plate.

A range of different holding forces can be achieved by connecting voltages between 0V and 30V to the magnet. At 0V the magnetic field is completely gone and there is no residual magnetism.

Rope Pull Switches
ABB JOKAB SAFETY
Line Strong switches are designed to be mounted on machines and sections of conveyors which cannot be protected by guards.

In contrast to traditional mushroom head type Emergency Stop buttons, Safety Rope Pull Switches can initiate the emergency command from any point along the installed rope length and provide robust emergency stop rope pull protection for exposed conveyors or machines.
CABLES AND CONNECTORS

Sensor Actuator Cables
Phoenix Contact
Molded cables and cordsets provide an error free, plug-n-play connection for signal transmission between field devices, such as sensors and actuators and the controller. The connector styles follow the industry standard specifications for M5, M8, M12, Micro ½-inch, Mini 7/8-inch and Valve plugs (DIN 43650). The PUR or PVC cables are designed for rugged industrial environments and meet IP65/IP67/IP69K protection categories. Many of these M8 and M12 cables are locally produced in the USA with short lead times.

Heavycon EVO
Phoenix Contact
Heavy Duty rectangular connectors provide an essential disconnect point for machine builders between manufacture and commissioning. However, unknown cable diameters and preferred cable entry location (top or side) prior to assembly often leads to excess on-site inventory or waiting on manufacturer lead times. Heavycon Evo reduces this inventory issue by allowing on-site selection/final assembly of the housing and gland, reducing logistic costs by 70%.

Sensor Actuator Cable Connectors
Phoenix Contact
Field wired cable connectors for signal applications are used for cable repair, extensions, or on-site cordset assembly of pigtails sensors. Selecting the appropriate connection technology can help technicians to save time in the field while making vibration proof, reliable electrical connections. Technologies like screw, spring cage, IDC and solder are available. The product range includes M8, M12 and Mini 7/8-inch screw thread from 3 through 17 pins.

Panel Feed through Circular Connectors
Phoenix Contact
Circular connectors are commonly used for quick connection of signal lines in sensors, actuators, drives, encoders, test and measurement equipment. These receptacles for device wall mounting in sizes M5, M8, M12 and Mini 7/8-inch with an industry standard screw thread. The product with the most versatility is the M12 which uses a small footprint but accommodates from 3 to 17 pin positions. The connectors carry IP67 protection, even when un-mated.
CABLES AND CONNECTORS  continued

**Standard Length RJ45 Patch Cables**

Phoenix Contact

Phoenix Contact has extended its offering of RJ45 8 position shielded patch cables to include both straight and angled configurations in standard lengths.

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**FiberExpress® Brilliance® Field-Installable Fiber Connectors**

Belden

FiberExpress Brilliance Field-Installable Connectors make fiber terminations really fast, simple and reliable. Brilliant in their design and implementation, they are the only fiber optic connectors in the marketplace to offer reliable terminations in less than five seconds – with NO termination tools needed! Unlike all other field-installable connectors, no tools are required to terminate the fiber. If you have the fiber preparation tools, you’re ready to go! Training is especially easy and straightforward. A simple product and three-step installation process removes installation inconsistencies.

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**The Belden VFD Solution**

Belden

Only Belden’s VFD cable series of 1000V and 2000V UL flexible motor supply cables in gauge sizes from 16-4/0 provide the robust construction required to deliver superior electrical performance and reliability, even in the most demanding industrial environments.

Thicker, Industrial-grade XLPE Insulation provides more stable electrical performance than PVC including lower capacitance resulting in:

- Longer cable runs
- Reduced peak motor terminal voltage for extended motor life
- Reduced likelihood of corona discharge
- Reduced magnitude of standing waves
- Increased efficiency of power transfer

High-strand tinned copper circuit conductors provide added flexibility for ease of installation.

**Design options include:**

- Foil/braid design VFD cable with full-size insulated ground
- Copper tape symmetrical design VFD cable, large AWG
- Foil/braid design VFD cable with signal pair
- Foil/braid design 2kV VFD cable (rated to 2000V)
- Copper tape symmetrical design 2kV VFD cable, large AWG (rated to 2000V)
- Foil/braid and symmetrical VFD cable with interlocked armor

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**RJ45 Field Wirable Connectors**

Phoenix Contact

Designed with Phoenix Contacts Quick Connection Technology for time-saving, error-free installation. The connector family is the ideal solution for assembling RJ45 cable assemblies.

Phoenix Contact’s original RJ45 Quickon connectors feature tool-free connection technology, which makes it easy to create a secure connection. The wires are simply pressed in the chambers to match the color coding and pressed into cutters with the cover cap. A preassembled plug connector eliminates positioning and lost parts.

The new RJ45 industrial connectors feature rugged die cast metal housings that provide 360 deg shielding. Available in both straight and angled versions to facilitate connectivity in tight environments.

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**Belden’s Cat 5e and Cat 6 DataTuff Industrial Ethernet Copper Cables**

Belden

The reliability of your Industrial Ethernet network is in large part dependent on the cable infrastructure since transmission errors can lead to downtime and even safety issues.

Belden’s Cat 5e and Cat 6 DataTuff Industrial Ethernet copper cables and connectivity products are designed for mission critical applications and are built to withstand the entire spectrum of environmental and mechanical hazards. DataTuff cables provide solutions from:

- Temperature extremes
- Moisture
- Indoor/outdoor exposure
- Abrasion
- Solvents
- Flexing
- Oils
- Crushing
- Chemicals
- EMI and RFI sources.

Belden also offers a line of TrayOptic optical fiber cables designed for harsh environments, available in single and multimode constructions.

Don't confuse commercial cables with industrial cables.
**Industrial Data Cabling Solutions**

**Belden**

Belden offers a wide range of Industrial Data Cabling solutions for all of your harsh environment needs. Belden’s cables support numerous protocols including:
- CC-Link
- CANopen
- ControlNet
- Data Highway
- DeviceNet
- EIA-485
- EtherNet/IP
- FOUNDATION Fieldbus
- Industrial Ethernet
- Interbus-S
- LONWORK
- MODBU
- MODBUS TCP/IP
- Profibus
- SDS
- Seriplex

**Opti-Core® IndustrialNet™ PCF Cable**

**Panduit**

Opti-Core® IndustrialNet™ Polymer Coated Fiber (PCF) Cables are designed with technicians in mind and are ideal for installation in harsh, industrial environments. Large diameter, high strength, highly durable graded-index PCF cables are suitable for applications that demand high mechanical integrity and reliability, and are easy to prepare and terminate using hand-held tools. Training takes minutes so it's suitable for electricians lacking experience with fiber optic networks. Available in two and four-fiber breakout cables, or two-fiber interconnect cables, (duplex zipcords). UV-resistance and water-blocking capability makes this cable suitable for use outdoors as well as indoors.

**LC Connector for Polymer Coated Fiber (PCF) Industrial Fiber Cables**

**Panduit**

Panduit field installable LC connectors attach to the large diameter PCF fiber using simple-to-learn and easy to use Panduit strip, crimp, and cleave attachment tools. Panduit LC connectors for PCF fiber contain a unique push-pull mechanism which is attached to the strain relief boot. Connectors are engaged or disengaged from an INF-8074i (LC) compliant SFP transceiver by pushing or pulling on the connector strain relief boot. This makes fiber connections easier and more reliable inside of a control panel or a difficult to reach area located in machines.

**Opti-Core® Dielectric Conduited Fiber (DCF) Cable**

**Panduit**

Opti-Core® Dielectric Conduited Fiber (DCF) Cable is used within buildings to provide high-density connectivity and ease of installation. Rugged conduit extruded over cable outer jacket eliminates the need for additional channel protection and provides a smaller crush resistant pathway for improved design flexibility and lower installed cost. All-dielectric construction eliminates the need for grounding and bonding, thereby reducing installation time and cost.

**UL and CSA Listed Compression Power Connectors for Code and Flex Conductors**

**Panduit**

Available in a broad range of styles and sizes.

**Terminal and Ferrules**

**Panduit**

Designed and manufactured for fast assembly and superior performance.

**Fiber Optic Indoor Interlocking Armored Cable**

**Panduit**

Provides superior crush resistance and eliminates the need for inner duct or conduit with a smaller pathway for improved design flexibility.
TeSys K IEC mini Contactors
Schneider Electric
K-Line mini-contacts and overload relays - available in three ratings up to 10 HP at 600VAC - are ideal for general duty applications where small size and reliability are key concerns. The special armature structure design allows all devices and all operating coils, either AC or DC, to have the same physical size and panel footprint for convenience. Devices are available with low consumption DC operating coils for direct connection to PLC circuits.

TeSys T Motor Management System
Schneider Electric
TeSys T is an advanced and green motor management system. Used with a short circuit protection and a contactor, TeSys T will provide full motor monitoring, control and protection for electrical motors. TeSys T has been designed for the management of critical processes for applications such as water wastewater, oil and gas and mining. Reduce downtime and save energy with the TeSys T exclusive predictive capability and full sets of intuitive and easy to use commissioning tools.

TeSys D IEC Contactors
Schneider Electric
The D-line contactors and overload relays are the largest selling line of contactors and starters in the world. They offer high reliability with long mechanical and electrical life and the most complete line of accessories in the industry.

TeSys F IEC Contactors
Schneider Electric
The F-line contactors and overload relays offer proven performance for resistive loads or large motor starting applications such as fans, crushers, pumps, compressors and overhead cranes. They offer high reliability with long mechanical and electrical life and the most complete line of accessories in the industry.

TeSys U Combination Motor Starter
Schneider Electric
TeSys U is a Self Protected Combination Motor Starter simple to choose, to install and to use. TeSys U consists of a control unit snapped in a power base and integrates a short circuit protection, an overload relay and a contactor. TeSys U is NEMA rated.

TeSys GV2 Manual Starters and Protectors
Schneider Electric
The GV2 manual starter and protector provides manual isolation, manual motor control and thermal overcurrent protection in one compact unit. The basic motor starter GV2ME controls motors with full load currents up to 32 A. The GV2P, high performance manual starter, offers a higher withstand rating and visible trip indication for convenience. The GV2P has an additional UL 508 type E rating as a stand alone self-protected manual combination starter. The UL 508 type E rating requires the addition of line side insulating barrier GV2GH7.

TeSys GV3 Motor Starter Protectors
Schneider Electric
The GV3 manual starter and protector provides manual isolation, manual motor control and thermal overcurrent protection in one compact unit. The basic motor starter GV3P controls larger motors with full load currents up to 65 A. The GV3P, high performance manual starter, offers a higher withstand rating and visible trip indication for convenience. The GV3P has an additional UL 508 type E rating as a stand alone self-protected manual combination starter. The UL 508 type E rating requires the addition of line side insulating barrier GV3G66.

TeSys GV7 Manual Motor Protectors
Schneider Electric
An ingenious alliance of electronic and electromechanical technology, the model GV7 range of motor circuit-breakers provides more effective protection, ideal for top-of-the-range applications. The GV7 is UL listed as Manual Motor Controller. It provides control and protection for motors with full load currents up to 220A.
TERMINAL BLOCKS AND INTERFACE PRODUCTS

IEC Terminal Blocks
Schneider Electric

AB1-VV Screw Terminal Blocks
- Most complete range in terms of size and functionality
- Components known and used throughout the world for many years

AB1-RR Spring Terminal Blocks
- Reduction in labor costs, front-mounting connection possible
- Safe connection independent of the operator

AB1-AA with insulation Displacement Terminal Blocks
- Even greater reduction in labor costs, intervention with the power on and isolation guaranteed

Circuit Protection
Phoenix Contact

From compact fuse terminal blocks, to Class I Division 2 EC-E series electronic circuit breakers, Phoenix Contact offers a complete line to meet demanding operational conditions in circuit protection.

Our fuse terminal blocks come in screw clamp, push in, spring cage and fast connection/insulation displacement connection for 5 x 20 mm and 6.3 x 32 cartridge fuses. The UK series fuse holders meet Supplemental and Branch (CC) rated protection requirements, with and without LED trip indication.

Phoenix Contact has a full line of circuit breakers for Supplemental protection. The UT 6-TMC M series uses push-in bridging for saving valuable wiring time. We also offer 1-, 2- and 3-pole thermal-magnetic circuit breakers up to 63A.

RIFLINE Complete, Industrial Ice Cube Relay System
Phoenix Contact

RIFLINE Complete is a modular ice cube-style relay system with innovative accessories. The relays range from a slim 6.2mm wide terminal block style relay to a small power contactor replacement. With our pluggable timer module, relays can easily be upgraded to timer relays.

Available with push-in termination (PT) technology, RIFLINE Complete relays reduce installation time, as no tools are required for installation. The relays are compatible with the familiar accessories from our CLIPLINE Complete terminal block series including: plug-in bridges, test plugs, end clamps and the marking accessories. RIFLINE Complete is an easy and economical application solution.

- UL recognized, GOST, CSA and CE certified
- Range from SPDT to 4PDT, with output currents from 6A to 16A
- No tools required with push-in termination technology
- Compatible with CLIPLINE Complete accessories
- Create timer relay using plug-in timer module

DIN Rail Terminal Blocks - Multiple Connection Systems, One Complete Solution
Phoenix Contact

DIN Rail terminal blocks from Phoenix Contact are available with a variety of connection technologies in a CLIPLINE complete system, including screw clamp (UT), spring-cage (ST), bolt (RT), insulation displacement (QTC) and push-in technology (PT). This wide range of options provides the right connection technology for any application. All connection technologies use a patented dual bridge system, which accepts the same push-in jumpers, accessories and standardized marking. Save time, space and money with this flexible and complete terminal block system.

Use CLIP PROJECT professional planning software to design fully-equipped DIN Rail assemblies with terminals, circuit protection, power supplies, relays and bus modules.

Slim Terminal Block Style, PLC Relays
Phoenix Contact

Phoenix Contact's slim PLC relays are the interface between your controller and field devices. PLC relays provide a complete range of universal plug-in electromechanical and solid state relays. In addition to the universal relays, specialty relays are available including: actuators, sensors, C1D2, ATEX and 10A high current. Whether you need to switch voltages from field devices to your PLC or need electrical isolation between control circuits, these relays are ideal for any application.

- UL Listed, GOST, CSA, CE and GL certified
- Available with screw, spring or PT push-in termination
- Complete range of SPDT/DPDT electromechanical & solid state relays
- Easy wiring with plug-in bridging and V8 cabling adapters

MINI PRO New Family of 6mm Signal Conditioners
Phoenix Contact

The new MINI PRO from Phoenix Contact is the latest generation of highly compact analog signal conditioners. MINI Analog Pro is the first 6 mm signal conditioner range with pluggable housing. Easily visible and accessible termination points, and current measurement during operation make your work even easier. The product family includes fixed signal versions as well as universal, freely programmable modules, that designed to isolate, amplify, filter and convert a number of different analog signal types. The products feature excellent signal quality with safe electrical isolation.

- Screw or PT, push in wire termination
- Pluggable, 6.2mm wide housing
- -40 to 70 C operating temperature range
- 9.6 to 30Vdc power supply range
- 3kV safe isolation, (1 min) (input, output, and supply)
- UL CID2, ATEX, and GL
Low-Peak®
CUBEFuse®
Eaton’s Bussmann business
- Finger-Safe Low-Peak CUBEFuse delivers superior protection with up to a 70% smaller footprint
- Finger-safe fuses minimize exposure to live parts, reducing hazard to personnel
- Minimizes incident energy and reduces arc-flash hazards utilizing Class J electrical characteristics
- Indicating option helps speed troubleshooting for reduced downtime
- Easy selective coordination with any Low-Peak fuse by using simple 2:1 ampacity ratio
- High 300kA interrupting rating and 600Vac voltage rating (100kA/300Vdc)
- Dual-element, time-delay feature permits closer sizing to load for Type 2 (IEC 947-4-1) “No Damage” motor starter protection that prevents equipment damage
- Easy installation in DIN-Rail and panel mount CUBEFuse 30A, 60A and 100A holders or Compact Circuit Protector (CCP) fused disconnect switch

Compact Modular Fuse Holders with Industry’s Best Ratings
Eaton’s Bussmann business
Finger-safe DIN-Rail mount fuse holders protect your electrical system and simplify installation.
- Easy color coding for use: yellow for PV, red for IEC and black for UL applications.
- Finger-safe, high SCCR rated, Class CC and midget holders with indicator options. Also for Class J and IEC size fuses
- Agency ratings up to 1000Vdc for use with solar PV fuses
- Available remote PLC indication with the CH-PLC module
- Rated for use with 75°C or 90°C wire, fine stranded wire, spade terminals and with comb-bus bars
- Complete range of UL Listed and high SCCR rated 1-phase and 3-phase finger-safe comb-bus bars and power feed lugs

UL Listed, Finger-Safe Enclosed Power Distribution Blocks Offer High SCCR
Eaton’s Bussmann business
Maximize short-circuit current rating while improving safety. 2008 NEC® and UL 508A SCCR marking requirements state that the following equipment must be marked with an assembly SCCR:
- Industrial Control Panels [409.110]
- Industrial Machinery Electrical Panels [670.3(A)]
- Certain HVAC Equipment [440.4(B)]

This SCCR is based on the lowest-rated component, or weakest link, in the assembly. Unmarked power distribution blocks will default to a rating of 10kA.

The enclosed PDBFS offers both enclosed Series PDBFS offers both high SCCR and enhanced shock protection.

- **UL Listing meets requirements eliminating investigation and procedures**
  Listed to UL 1953 for minimum spacing requirements of at least 1” through air and 2” over surface as required for UL 508A industrial control panel feeder applications
- **High SCCR**
  Up to 200kA rating enables the power distribution block to be one of the highest rated devices in the panel. This helps achieve a high assembly SCCR
- **Enclosed for enhanced electrical safety**
  Safer work conditions. Finger-safe and IP20 under specific conditions
- **Modular, space saving design**
  Gangable for flexible multi-pole installations, plus small footprint for tight spacing

MTL1000 Series
Signal Conditioners
MTL Instruments
The MTL1000 Series of modules and accessories is designed for use with process connected systems. It consists of compact isolating interface modules mounted on 35mm DIN rail. Power is provided through a DIN rail mounted power bus, to which, the isolator module is plugged into when clipped onto the DIN rail. Power is supplied to the isolators via a dedicated power feed module which also provides current limit protection in the event of a fault. The MTL1000 series modules provide power and status information via LEDs on the top of the module. Where module configuration is required, then switches are accessed by the user through the side cover.
Compact Circuit Protector

Eaton’s Bussmann business

3X the protection in 1/3 the space of equivalent circuit breakers.

Smaller.
- 2/3 the space required by a traditional fusible switch, the CCP saves panel space
- Finger-safe construction helps prevent exposure to live components
- 200kA SCCR with Low-Peak™ CUBEFuse and Class CC fuses helps provide high assembly SCCR
- UL 98 Listed, horsepower rated fused disconnect
- Built-in switch/fuse interlock prevents fuse removal while energized
- Open fuse indication lights speed troubleshooting
- Lockout/tagout capability promotes safer workplace practices
- No tools required for mounting onto DIN-Rail
- More fuse options: Class CC, Class J performance Low-Peak CUBEFuse, Midget and IEC 10x38 aM and gG/gL
- Optional wired remote open fuse indication can be utilized to signal a PLC and open a contactor to de-energize all phases, if required

Identification Systems

Phoenix Contact

Phoenix Contact offers complete systems to label the components in and around the control cabinet including terminal blocks, wires and cables and devices such as pushbuttons and the cabinet door. Choose from a wide range of marking materials such as snap-in terminal block markers, shrink sleeves, self-laminating adhesive wraps and adhesive labels in various colors and special properties. Our printer systems are easy to use, durable and run off the same software. At 1/3 the space required by a molded case circuit breaker and 2/3 the space required by a traditional fusible switch, the CCP saves space in your panel.

Wireless

Phoenix Contact

The Radioline platform is a flexible, simple to use, wireless platform that allows users to choose from three modes of operation, wire in - wire out, wire in - Modbus out or serial in serial out. Without the use of software, it is possible to configure a wire in -wire out system up to 98 nodes.
- 3 Modes of operation
- Real time I/O diagnostics via Free programming software
- Hot swappable I/O
- Adjustable Data rates up to 500 kbps
- Class I Division 2 for Hazardous locations
- Robust Frequency Hopping Technology

Wireless MUX

Phoenix Contact

The Bluetooth Wireless Mux allows bi-directional wireless transmission of 16 digital and 2 analog signals between two locations in less than 10ms transmission time. Depending on field conditions, distances of up to 400 meters can be achieved. As a result, process and control signals can be transmitted in adverse conditions when laying cables may be costly or impossible. Communication uses the industrial Bluetooth profile, which operates at 2.4 GHz with an integrated, adaptive frequency-hopping process to ensure reliable data transmission without interference from existing WLAN 802.11b/g systems. The units offer diagnostic and status indications for signal strength, I/O status, short circuit and wireless fail-safe mode. One part number consists of two modules with two OMNI or panel antennas.

WLAN

Phoenix Contact

Industrial WLAN allows for high speed data communication for industrial applications. Full function 802.11n options along with low cost client only options are available.

High Power WLAN (HPWLAN) allows you to extend your existing wireless Ethernet network by pushing the signal further with more power over the 2.4 GHz RF spectrum. ATEX approved for international operation.

FL WLAN 5101 offers up to 300 Mbps data rate in the industries smallest 802.11n package. SD card configuration option for quick and easy programming.
Wireless PLC Protocol Gateways

MTL Instruments

Powerful, long range 150-512MHz licensed (5W) and 900MHz licensed-free (1W) wireless gateways that translate between PLC protocols, and/or convert I/O to/from PLC protocols.

Long-Range Wireless Mesh Networks for I/O and Modbus

MTL Instruments

The ELPRO 915U-2 provides a self-seeking, self-healing 900MHz license free wireless mesh network to extend I/O and Modbus data communications between sensors and control systems in noisy, remote, or difficult-to-reach locations.

915U-2 Wireless Mesh I/O and Modbus Gateway

- Onboard Digital and Analog Inputs and Outputs expandable to hundred's of I/O points per radio
- 900MHz frequency hopping (FHSS) up to 1W TX power
- Self-healing IP-based wireless mesh/repeater networking
- Modbus TCP or RTU master/slave functionality
- Secure 256-bit AES encryption
- Over-the-air network diagnostics and configuration
- Scalable to thousands of nodes
- Optional support for logging of register variables
- Class I Division 2 hazardous area approvals

3G Cellular Data Communications

MTL Instruments

The ELPRO 615M-1 is a powerful multi-service provider 3G cellular broadband router that delivers wireless data connectivity for Ethernet, RS-232 Serial, and I/O data at 3G network speeds.

615M-1 Multi-Service Provider Cellular Modem and Router

- Powerful multi-service provider 3G cellular broadband router delivers wireless data connectivity for Ethernet, Serial, and I/O data at 3G network speeds
- Multiple service provider protocols: GPRS/EDGE, UMTS/HSPA, EVDO Rev0/A, 1xRTT
- Client and router configuration
- IPsec, GRE tunneling, PPTP, VPN, RADIUS/802.1x
- Built-in DHCP server and port forwarding
- Dual 10/100baseT IEEE 802.3 Ethernet
- RS-232 serial port
- Class I, Division 2 hazardous area approvals

BAT Industrial Wireless LAN

Belden/Hirschmann

The Hirschmann BAT Family includes a broad portfolio of access points, clients, controllers and antennas that work seamlessly together for maximum mobility, flexibility and network availability in industrial environments.

- Up to two built-in wireless interfaces supporting IEEE 802.11a/b/g/n WLAN standards
- Rugged housing for installation on DIN rails, walls or poles, or IP67 ingress protection
- Extended temperature range: -40°C to at least +70°C
- Different types of power supplies selectable, 24 V DC PoE, 48 V DC, 90 to 230 V AC, 48 to 320 V DC

Long-Range, High-Speed Wireless Ethernet Modems and Switches

MTL Instruments

Wireless and wired Ethernet products to solve the most challenging communications issues.

Ethernet Modems

- Reliable, powerful communications to extend Ethernet networks in difficult-to-reach locations.
- Broad range of licensed and unlicensed; high-speed, long range and ultra-long range models
- Wireless modems support 400MHz, 2.4GHz, 5.8GHZ, and 900MHz frequencies
- Together with our Network Management System, provides end-to-end network connectivity for increased productivity, improved safety and reduced total cost
New Lithium-Ion Battery-Powered Crimping Tools
Panduit
Provides up to 98% more crimps per charge and up to 26% faster cycle time.

Contour Crimp Controlled Cycle Tool
Panduit
Ergonomically designed.

Wire Stripper and Cutter
Panduit
Ergonomically-designed for safe and easy stripping and cutting of copper and aluminum wires.

Cable Tie Tool
Panduit
Ergonomic design to ease installation and reduce fatigue; provides flush cut-off and speeds installation to lower installed cost.

Semiautomatic Ferrule Crimping Tool
Panduit
Wire cutting, stripping, ferrule termination and dispensing all in one tool for quick and easy installation.

Thermal Transfer Hand-Held Printer with QWERTY Keyboard
Panduit
Keypad design similar to smart phones for faster, easier typing.

Power Quality Analyzer 435 Series II
Fluke
Best suited for:
- Quantifying the cost of energy loss due to poor power quality
- Measuring the efficiency of inverters in solar and wind UPS systems
- Troubleshooting and preventing problems in power distribution systems
- Uncovering hard-to-find or intermittent issues
- Power quality surveys
- Validating incoming power quality at the service entrance

TOOL Fox
Phoenix Contact
TOOL Fox’s complete line of durable, ergonomic, industrial hand tools guarantee high levels of efficiency and quality — all covered by Phoenix Contact’s limited lifetime warranty.

Find cutting tools for a variety of diameters, stripping tools that come with interchangeable blades, crimpers offering many ferrule crimp geometries and our torque screwdrivers that match your terminal block specifications.
Cylinders and Actuators

The first single-acting pneumatic cylinders in Europe were manufactured by Festo. Today, Festo offers pneumatic drives for a wide range of applications, from single-acting, compact and round cylinders to semi-rotary drives or clamping cylinders.

- ISO Standard and non-standard cylinders
- Linear guides and slides
- Piston rod and rodless cylinders
- Semi-rotary drives

Air Preparation, Pneumatic Connections and Tubing

Everything from a single source: Festo provides a perfectly fitting and cost-efficient installation solution for every task. Tubing for a wide range of working environments: including versions for the food industry, flame-retardant, PWIS-free or media-resistant designs.

- Filters, regulators and lubricators
- Service unit combinations
- Soft-start, exhaust and safety rated valves
- Push-pull, barbed and threaded fittings

Servo Pneumatic Technology

If you are looking to achieve cost benefits of up to 50% in comparison to servo controlled electro-mechanical solutions, want to implement new approaches to problem solving which combine positioning and force control, require controlled high power density and already have compressed air available, then Servopneumatics is the right solution for your application.

- Proportional valves
- Actuators with external encoder
- Actuators with integrated encoder

Valve and Valve Manifolds

As the inventor of the valve terminal, Festo is also a valve expert. From simple, low-cost applications to complex automation tasks, Festo has the right valve for every purpose. For all industry segments, from the food and packaging industry to the automotive, electronics, wood and textile industry, to process automation. With the features you expect from Festo: robust and durable quality with up to 100 million switching cycles, worldwide delivery and comprehensive engineering support.

- Electrically and pneumatically actuated valves
- Manual and mechanically actuated valves
- Proportional and directional valves
- Intelligent valve manifolds

Handling and Vacuum Technology

Ready-to-install handling systems significantly reduce your process times, from project engineering to commissioning. Complete vacuum range consisting of simple vacuum generators, valves suitable for vacuum, vacuum switches and vacuum grippers.

- Vacuum generators and grippers
- Suction cups
- Mechanical grippers
- Feed separators
- Valves for vacuum switching
- Pick and place units
- Advanced handling system

Sensors and Machine Vision

Festo’s proximity sensors are sensors specially optimized for use with Festo drives and indicate the position of the piston rod. Position transmitters, e.g. SMAT, continuously record the movement of the piston in the position measuring range and output that information as a standardized analog current or voltage signal. Pressure sensors and vacuum switches accurately control all pressure values, ensure greater reliability and offer the option of remote maintenance and monitoring.

- Proximity, inductive and position sensors
- Optical sensors
- Pressure, vacuum and flow sensors
- Camera system
Control Technology
FESTO
Electrical and pneumatic control unites and peripheral equipment for simple or complex control tasks in automation.
- Electrical positioning systems
- Electronic controllers
- Electrical peripherals
- Visualization software

Electromechanical Components
FESTO
Festo offers a comprehensive line of Actuators, Motors, Drives and Motion Controllers. Festo is capable of solving the most complex automation requirements.
- Belt and screw actuators
- Rod style actuators
- Motors and drives
- Linear motors

Complete System Solutions
FESTO
Festo offers a wide range of standard products, but it also capable of creating completely customized applications, with pre-assembled components. Product designs according to the customer’s special requirements and engineered sub-systems combining both pneumatic and electric motion.
Our experienced engineers provide complete support at every stage of your Development process, including: conceptualization, analysis, engineering, Design, assembly, documentation, validation, and production.

RTK725B MTL Process Alarm Equipment Protect
MTL Instruments
Enhanced design with event recording and communication features.
The RTK725B brings together many years of development in Alarm Annunciator technology and represents the best available investment in protection for your industrial plant.
Using advanced communication techniques, coupled with MTL’s unique multi-redundant design, the RTK725B Annunciator gives the best combination of flexibility, usability, reliability and cost of ownership
- Modular construction with 2 to 256 alarm ways
- Multi-redundant design so there is no single point of failure
- Interchangeable, white LED illumination as standard
- 1ms Event Recording functionality up to 256 points
- Isolated RS485 serial communication

GiR6000 Biogas Analyzer
Multiparameter analyzer for biogas applications
MTL Instruments
The GiR6000 series Biogas analyser is designed specifically to address the needs of measurement in biogas applications. Reliable and accurate measurement data is crucial to help control and optimise the production process.

Intelligent modular sensors
- Measurement of up to 6 gases (incl. CH4, CO2, H2S & O2)
- Customised sensor options
- Intelligent sensors provide predictive diagnostic data
- Pre-calibrated, field replaceable sensor modules
- Robust, weatherproof design to IP65
- Suitable for ATEX Zone 2 mounting
- Digital communication options
- Future upgrade potential by adding/changing sensors
- Sensor health and process event logging

Typical Applications include:
- Anaerobic Digester gas analysis
- Gas-to-grid
- Flare stack monitoring
- CHP engine protection and efficiency
- CDM verification
- Landfill gas monitoring
Machine Lighting

Phoenix Contact

Machine lights from Phoenix Contact set the bar high for efficient illumination of industrial machines. This is accomplished through the use of high quality LED technology, glare suppression optics, and easy installation with daisy chainable M12 cabling. The product range consists of lights in 200, 365, and 695 mm lengths, with emission angles of 50° or 100°.

Solar Power Modules

Eaton’s Crouse-Hinds business

- Supply power to monitor remote assets and their locations to improve emergency response time and eliminate time-consuming, on-site inspection
- Pre-wired kits allow for quick installation by any qualified electrician
- Long, maintenance-free battery life (4-6 years)
- Class I, Div. 2 assemblies available

TEST AND TROUBLESHOOTING

Vibration Tester 810

Fluke

Target customers

- Plant maintenance personnel
- Persons who need to keep rotating machinery running – motors, fans, pumps, bearings, etc.

You will understand

- Root cause of faults and fix it right the first time
- Severity of failures and prioritize your repairs
- Location of faults and focus your repair work
- It requires minimal upfront investment…but the ROI is significant

TECHNICAL SEMINARS/TRAINING

Graybar offers many manufacturer-sponsored technical seminars and automation product training options, including:

- Industrial networking
- PLC software platforms
- HMIs and data gathering and display
- Industrial sensors
- Power monitoring and power management

Questions:

Have you had excessive downtime that could have been prevented or reduced if your personnel were better trained to work on automation and control equipment?

- Did lack of maintenance or a poor maintenance program cause electrical outages or breakdowns that affected production?
- Could a preventive/predictive maintenance program help your electrical department?
- Does your company hold periodic employee training for electrical distribution equipment and/or automation and control equipment?
- Does your company specify new equipment product training as a deliverable for new installations?
- Are there areas where your team would benefit from additional technical training on electrical, distribution or automation and control equipment?

Let Graybar help you with your training needs. We can set up the proper curriculum held at our facilities, our manufacturers’ facilities or at your location.
Graybar can offer the following services to support your Automation and Control needs:

- Product selection and sizing
- Product training – PLCs, HMI, SCADA, wireless, etc.
- Automation system audits
- Automation software version audits and updates
- PLC programming assistance
- HMI/SCADA programming assistance
- Application evaluation and testing
- Panel layout assistance
- Variable Frequency Drive (VFD) solutions
- Drive start-up and commissioning
- Electronic equipment and circuit board repair services*
  - Printed circuit boards, PLCs, HMIs, drives, Servo motors, etc. (all major manufacturers)**
- Power monitoring/management system analysis
- Power quality analysis – utilizing a Fluke 435 meter
- Thermal imaging – utilizing a Fluke thermal imager
- Industrial network/mission critical network layout
- Network scanning – cyber security analysis
- Wireless site survey
- Temporary wireless network setup
- Kitting
- Machine safety audits

“Get repairs done faster and more economically than OEMs”

- Our optimized repair process provides faster repair turnarounds
- Very competitive repair prices
- Repair many items the OEM no longer supports

- AC Drives
- Clutch Controls
- Computer Check-Weighers
- CNC Controls
- Counters
- DC Drives
- DCS I/O
- Flame Controls
- Power Supplies
- Printed Circuit Boards
- Process Controls
- Programmable Logic Controls (PLC)
- Sequencers
- Servo Controls
- Servo Drives
- Servo Motors
- Industrial Monitors
- Industrial Workstations
- Input/Output Modules
- Instrumentation
- Machine Specific Controls
- Message Displays
- Meters
- Operator Interface Devices
- Stepper Motor Controls
- Temperature Controllers
- Test Equipment
- Timers
- Transducers
- UPS
- Vector Drives
- And MORE from thousands of brands

*Repair services offered through Schneider Electric Industrial Repair Services.
We work to your advantage.

Graybar, a Fortune 500 corporation and one of the largest employee-owned companies in North America, is a leader in the distribution of high quality electrical, communications and networking products, and specializes in related supply chain management and logistics services.

Graybar understands automation and control and can provide real-time data and transparency from shop floor to top floor. Graybar is ISO 9001:2008 Registered.

Discover how Graybar can work to your advantage.