

NEWSBYTES

INNOVATIVE PRODUCTS PROCESSES AND APPLICATIONS FOR INDUSTRY

The Blackout of 2003 From The User Point of View

Last quarter NewsBytes featured SoftSwitching Technologies, an emerging leader in power technology, and its innovative I-Grid web-based power monitoring system. Was NewsBytes prescient, or did the shoe finally drop as most knew it would? I-Grid, the web-based data collection system, which draws data from private installations of SoftSwitching Technologies I-Sense monitors, captured the progression of the blackout from the user point of view. This information may be reviewed at <http://www.softswitch.com/news.htm> with a news item dated August 27. Of interest to all those affected by the blackout is the Initial Blackout Timeline, published by the U.S./Canada Power Outage Task Force September 12, 2003, available at http://www.doe.gov/engine/doe/files/dynamic/1282003113351_BlackoutSummary.pdf.



For a range of views on the blackout and resolution of utility grid problems see http://www.energypulse.net/centers/topics/article_list_topic.cfm?wt_id=50. Each article is accompanied by sometimes lively responses from readers and experts. See related article on page 4.



Industrial Ethernet - A Strategic Asset for Manufacturing

"Office" Ethernet provides ease of communication across the office environment. That impetus - ease of communication of data to and from every part of the enterprise - is behind Industrial Ethernet. This article explores why Industrial Ethernet is gaining in application and could become a strategic asset for manufacturers.

Critical Mass

The vision of Industrial Ethernet is that an open system connection — all the way from the device to the corporate head office — is not only possible, but also necessary. IE technology has been around for several years; the hardware and software to deliver the vision possible exists. However, making Industrial Ethernet's use on the factory floor "necessary" will take a bit more. It will require a critical mass.

Currently, a range of tools has been developed to use Industrial Ethernet's increased bandwidth for remote device configuration and status monitoring, as well as transmission of process data. Business can certainly use factory floor data to help optimize the bottom line.

However, "necessary" or "widespread" Industrial Ethernet use is wrapped in a typical growth challenge: as more information becomes available because of Industrial Ethernet, more information will be demanded, from even more sources. The development of hardware and software to support Industrial Ethernet (the link into the process to capture this information) will continue to increase as business realizes the value of this data and looks for more ways to capture and structure it. However, during these early years, sometimes the need is ahead of the technology, and vice versa.

Nonetheless, the future is in Industrial Ethernet. Harry Forbes, a senior analyst at ARC Advisory Group, suggests that down the road, Industrial Ethernet networks may well form the foundation for real-time performance management systems. That data, when used appropriately, can carve a very competitive edge. Frank Koditek, a manager at Belden, Inc., affirms Industrial Ethernet's future. He recently noted that Industrial Ethernet implementation is picking up steam, in diverse markets such as transportation and pharmaceuticals.

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Industrial Ethernet Advantages

Industrial Ethernet offers lower cost, higher bandwidth, and a way to IP-enable the factory floor. Those organizations that can shift their paradigm from limited information, often manually logged, and physical “rounds and checks” (often designed merely to induce visual inspection of process equipment that should be done as a best practice), to software-based condition and process monitoring and reporting can bring to bear a greater number of intelligent resources for continuous improvement. Condition monitoring sees the equipment continuously, rather than a few times during the day. Fast Ethernet and Gigabit Ethernet provide the bandwidth to accommodate video over the network for real-time transmission of information from hazardous or “disagreeable” locations in the process, which may otherwise not receive the necessary visual inspections. Applications are boundless, once the paradigm-shift and technological development occur.

Another advantage of the greater bandwidth is the ability to continuously monitor the network itself, including the location and “health” of devices and network components. Network Visualization software IntraVUE from Network Vision, Inc., available from McNaughton-McKay, is an excellent example of such a tool. It provides a complete image of the physical network structure, continuously updates the status of the network, and provides management for connected devices. It works with all IP addressable devices that support SNMP. IntraVUE reduces the need for IT network resources in resolving basic network problems. With a high scan rate of all connected devices, the sometimes quirky intermittent problem is uncovered for resolution. Network security is enhanced by identifying all new devices being connected to the network, even through wireless access points. Any attempt to “hack” into the network is logged for immediate or future action. Visualization of network problems brought about by adding improperly configured devices helps prevent accidental changes from bringing down a process or creating a hazardous situation. The IntraVUE visualization uses web browser technologies that provide for coupling network information with diagnostics information for each device, circuit diagrams, drawings, manuals,

FAQs and repair videos supporting troubleshooting and repair to maintain business continuity.

Overcoming Obstacles

Much of the vision of Industrial Ethernet was vaporware until a number of problems were resolved: determinism, the ability for information to reach destinations within a short, fixed time without collisions between adapt packages, the lack of power supply within the Ethernet standard, and intrinsic safety.

The inherent non-deterministic nature of Ethernet has been largely resolved by several manufacturers through hardware and software, notably the Hirschmann HIPER-Ring (Hirschman Performance Redundancy - Ring). Hirschmann is represented by McNaughton-McKay, and is a Rockwell Automation Encompass Partner.

Very recently introduced chip-based technologies may eliminate the requirement for switches that provide redundant paths to eliminate collisions. Power to field devices was not originally included in the Ethernet standard because of its “office” orientation, where power requirements were centralized. A new standard, IEEE 802.3af, provides for 3,000 mW of power over Ethernet for sensor and instrument power. The consensus is that intrinsic safety will be demonstrated for lower than 3,000 mW of power, overcoming the last hurdle to linking everything over Ethernet.

The vision of Industrial Ethernet is coupled with a growing demand for network intelligence at ever lower levels. Estimates are that 80% of network intelligence is in controllers now, but that will decline to 54% over the next two years. With truly distributed intelligence, communications functions fulfilled by Ethernet technology are more important.

Another branch of technology is diminishing the differences between PLCs and PCs. Although a “protocol war” seems to be shaping up around Industrial Ethernet, similar to the “fieldbus war” of the 1990s, market pressure may be even greater for completely interchangeable, interoperable devices and components. The importance of Industrial Ethernet is demonstrated by the market entry of Cisco Systems with High Speed Ethernet switches with potential for Gigabit Ethernet connectivity in the future. Cisco has been brought into the Rockwell Automation fold through the Encompass program.

McNaughton-McKay represents a broad range of process control system manufacturers who are striving to support the movement to Industrial Ethernet in the most customer advantageous ways possible. Check with them to stay abreast of all the latest developments as Industrial Ethernet matures and truly fulfills the vision of integration in enterprise wide information systems.



Allen-Bradley's Industrial Operator Interfaces with UL Listings for Hazardous Locations

It's hard enough keeping up with the fast changing world of operator interface and certifications. Now Rockwell Automation has made it even easier for you. Rockwell Automation's Allen-Bradley's PanelView line of operator interface products has received the Underwriters Laboratories (UL) listing for Class 1 Division 2, Class II Division 2, and Class III Division 1 locations in the United States and Canada. The UL listed PanelView operator interfaces meet the United States National Electric Code and Canadian Electrical Code standards of certification for hazardous location equipment installations.

If you're spending time searching for components with acceptable environmental ratings, stop. Allen-Bradley's UL-certified PanelView line cuts your installation time and expense by allowing OEMs and end-users to install the operator interface directly into the application, thus avoiding additional equipment and recertification costs.

PanelView terminals come in a variety of sizes and configurations from stand-alone single systems to multi-layer, enterprise-wide solutions. Compatible communication protocols include DeviceNet, ControlNet, Data Highway Plus, Remote I/O, DF1 (RS-232), DH-485, PROFIBUS, and Modbus.

For more information on Rockwell Automation's solutions to your computer needs, call your knowledgeable software engineers at McNaughton-McKay.



AE & CE Series Acme Electric's Encapsulated Industrial Control Transformers

If you've ever needed a high-quality industrial control transformer, designed specifically for machine tool control circuit applications, Acme Electric's AE & CE Series Encapsulated Industrial Control Transformers may be for you.



These easy-to-install transformers feature a compact design, helping to minimize the space necessary for mounting. They also can handle potentially damaging high in-rush currents that occur when electromagnetic components are energized, without sacrificing the required stable output voltage. With a range from 50-750 VA and available fusing on the primary and secondary side, these rugged transformers are ideal for industrial control applications.

Other Superior Features

- Epoxy encapsulated copper windings and internal terminations, protecting core and coil assembly from contaminants.
- Integrally molded terminal blocks with isolation barriers to prevent arc over.
- Heavy gauge steel mounting feet.
- Dual labeling for easy product identification when equipped with a fuse block.
- Touch-proof terminals, (CE Series) which isolate live contacts.

Acme Electric's AE & CE Series Industrial Control Transformers are the solution to your industrial control applications needs. To learn more about these high performance control transformers, contact McNaughton-McKay.



Remediation of Legacy Systems: Strategies, Roadblocks, and Benefits

When biotechnology and pharmaceutical engineers got their first glimpse of FDA code 21 CFR Part 11 in August of 1997, they might have remembered the old saying, "Be careful what you ask for... you just might get it." The industries regulated by the FDA had pushed for new codes that would allow advances in technology, such as electronic signatures, to be implemented. Once faced with the daunting task of meeting those stringent controls, however, many executives have balked at the scope of the process. While the FDA has allowed extra time for legacy systems to be brought into compliance with the code, the existing equipment and conventional processes must eventually be either replaced or remediated.

In addition to avoiding fines and sanctions by the FDA, compliance with 21 CFR Part 11 and utilization of the technologies it controls will also afford business benefits. As a company moves toward paperless processes, the costs associated with handling and filing paper records will decrease. Electronic compilations of data also expand the possibilities for data mining, knowledge management, and information exchange capabilities. Reducing human access to data also decreases the opportunities for introduction of human error.

The route to compliance is not without its roadblocks, however. The most obvious is the extensive commitment of time and resources needed to re-engineer or remediate legacy systems. These systems are already networked to other systems, and many are real-time control systems that carry the added burden of immediate and major production ramifications if they are taken offline for updating. In short, many feel the task is

somewhere between overwhelming and impossible.

Individuals and organizations nationwide have answered the call for help by developing seminars to help businesses

establish a plan for the remediation of their legacy equipment. Consultants specializing in remediation have also sprung up, providing the added benefit of a single access point for the company-wide plan. An outside consultant lends consistency to the project, and the methods and objectives used in each operating unit will align with an overarching compliance strategy.

While the particular details of each compliance professional's methodology may vary, the majority agree on several key steps that will help bring a company's legacy systems into compliance.

- Perform an extensive inventory to identify exactly what systems, equipment, and applications are in use.
- Prioritize the components based on criticality, placing the most crucial processes at the top of the list.
- Complete a gap analysis on each individual system to identify the compliance shortfalls within that system.
- Create a remediation plan and schedule, relying on the prioritization list to determine which processes should be updated first.
- Implement the plan, taking care to include operator and manager training on new procedures or processes as the work proceeds.
- Continue to evaluate and test the systems to ensure the specifications and user requirements defined in the implementation plan have been met.

The initial process of remediating legacy systems, despite its intimidating scope, offers a tremendous opportunity to re-engineer systems, streamline processes, and boost business performance. Compliance with 21 CFR Part 11 is a continuing evolution more than a steady-state, and like all quality systems, vigilance and on-going effort will be required to maintain it.





Protecting Factory Floor Data With A Disaster Recovery Plan

The blackout of August 2003 cost some companies much more than the investment would have cost in the creation, testing, and maintenance of a complete Business Continuity Plan, of which a Disaster Recovery Plan (DRP) is a major part. Whether you now have a renewed interest in planning or just need affirmation that your current approach is appropriate, here are some thoughts and ideas regarding protecting a business essential — factory floor data.

The IT Paradigm

Traditionally, DRP has been a focus of IT, with established guidelines for backups, offsite file storage, and emergency procedures. However, IT procedures do not resolve all the issues around manufacturing, with its customized manufacturing systems, unique machines and equipment, proprietary processes, and increasingly extensive enterprise-wide communications. Major events are not the only causes of lost production and hits to the bottom line. Small events, like brownouts and lightning strikes, can be more problematic than disasters like floods and fires...especially when loss of a competitive edge and customer confidence are added to the bottom line.

Because IT and process control data and systems security approach the same concept of data protection from different directions, the following key points may help ensure that process engineering and IT understand each other's basic concerns:

1. IT sees performance and data integrity as paramount; manufacturing sees human and plant safety as primary. As an example, standard password lockout procedures, which deny access after three attempts, may prevent action by a tired, possibly panicked, operator to control a serious problem from an HMI.
2. In disaster recovery, IT sees protecting the central server as critical; process control focuses on the edge devices. Protecting the server from access by a workstation may not be appropriate for a PLC on the edge of a wireless network.
3. Many processes require real-time performance and continuous operation that is rare in IT applications. Security technology implementation must consider the performance impacts on efficiency and time-critical response of process control systems.
4. Process control systems, especially those tried-and-true that have been performing for years or decades, may have unusual operating systems that may not be compatible with some software-based security systems. The consequences may be unintended. As an example, an emergency boiler shutdown system occurred due to an incompatible antivirus program installed on the control computer.
5. IT DRP is typically a line item in budgeting, ranging from 6% of the budget in financial companies to 3% to 5% average across IT. Manufacturing typically doesn't break out data DRP; it can be back-burnered by other maintenance activities if it isn't a measured priority.

Disaster Recovery Tips

Interest in protecting data-dependent systems such as PLCs, DCSs, soft controls, robotics, sensors, and configurations of specialized machinery is increasing. There are considerations beyond the key point in any disaster recovery scenario (backing up.) Hopefully everyone now understands its importance. Beyond backing up, a DRP should:

1. Put someone in charge. DRP will fail without a leader. A certified professional, or a consultant, may be required, depending on enterprise size and complexity.
2. Identify critical processes. Know what parts of the operation to bring back online first. Understand processes and prioritize which pieces are most important.
3. Hold people accountable. Every plant and division must have a disaster recovery leader to update the plan, train personnel, run tests and drills, and provide support to the person in charge of the overall plan.
4. Document everything. Document devices and processes. Failure to document a PLC configuration cost one plant a half million dollars in a single day because of a power outage. Central records on tools and devices will be essential when you need to rebuild or reboot. Think beyond PLCs and PCs, also consider motors and control valves.

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5. Focus on details. Comb through everything. One facility with a back-up generator failed to ensure its compatibility with their fax machines - a primary communications tool essential to their business. Practice annually to flush out the details.
6. Inform suppliers. A part of the plan should advise suppliers of the alternate production address. Keep enough of the latest supplies on hand to cover the first 24 hours at the alternate production site. The supply chain is likely to be disrupted in any wide-spread disaster and will take time to find new routes.
7. Keep current. Change control and disaster plan maintenance demand rigor and discipline. Update plans with changes in all areas of production, and administration. Periodically review it.
8. Involve technology vendors. Established alliances can be key to providing replacements of lost or damaged items.
9. Ensure adequate insurance. Build a relationship with your insurance company so they have what they need before disaster strikes - serial numbers, device types, etc.
10. Communicate. Factory disasters can involve explosions, smoke, or other visible effects. The plan must address the means of communicating with the public, during and/or after recovery, as well as with employees who are concerned about their jobs and safety.

McNaughton-McKay can assist you in reviewing risk to your factory floor data, and can provide a multitude of solutions from providers such as Allen-Bradley and Rockwell Software, SoftSwitching Technologies, Sola Hevi-Duty and others. Technology can help define and monitor potential problems, analyze power consumption and process economics, and keep abnormalities from having to be addressed by a DRP.



Sola/Hevi-Duty S2K Line-Interactive UPS

by **John M. Cooper**
McNaughton-McKay Electric
Greenville, South Carolina

Sola/Hevi-Duty has been a reliable source for industrial power quality products for over seventy-five years and the S2K UPS continues that tradition. Just introduced, the S2K Series of ultra-compact, line-interactive Uninterruptible Power Supplies (UPS) featuring Automatic Voltage Regulation (AVR) topology and data line protection provides advanced protection in a small package.



Sola/Hevi-Duty S2K UPS's prevent highly sensitive equipment, such as PC's, workstations, PLC's and computer peripherals, from being damaged in the event of surges, spikes, lightning strikes, blackouts and other severe power disturbances. The built-in AVR saves battery power for deep sag situations when input voltage is below 78V.

The S2K design gets high marks for its intelligent battery management and hot-swappable batteries that do not require shutdown for replacement – two valuable features typically not found on this type of UPS. An automatic bi-weekly test function insures the capability of the battery to supply power in emergency situations.

Sola/Hevi-Duty S2K UPS's are available in 120 and 230 VAC models with power ratings from 300 VA through 1000 VA.

The S2K Series complements Sola/Hevi-Duty's broad range of UPS solutions from 350-20 KVA. McNaughton-McKay is a proud distributor of Sola/Hevi-Duty offerings. Contact us today!



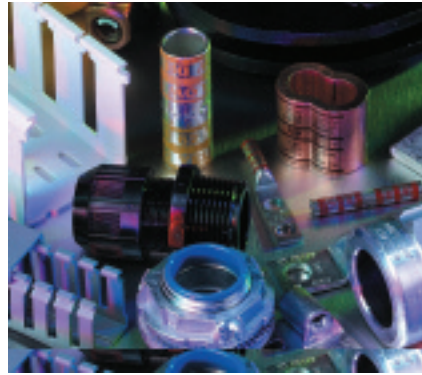
Thomas & Betts: Working Behind the Scenes with McNaughton- McKay To Help You Run Your World Smoothly

McNaughton-McKay is pleased to bring you products from Thomas & Betts. This leading designer, manufacturer, and marketer of electrical components and systems for connecting, fastening, protecting, and identifying wires, components, and conduits are essentially invisible to the consumer. Thomas & Betts products are found behind the walls of offices, homes, and commercial enterprises throughout the world.

Thomas & Betts products cover all of your building needs:



- **Electrical Products:** Whether you're involved in industrial maintenance and repair or manufacture of original equipment, Thomas & Betts is the leader in innovative engineering since the earliest days of electrification. You'll find Thomas & Betts products wherever electricity is used.
- **Utility Products:** Cable accessories, switches and fuses, connectors, secondary underground, just about everything you could possibly need.



- **CATV and Telecommunications:** Accessories, bags and pouches, brackets, CATV Connectors, cable support, and cable ties, are just some of the products listed.
- **HVAC:** A wide range of Reznor heaters, blowers, and cooling units. Gas-fired garage and factory heaters and a line of Used Oil Fired Heaters that eliminate disposal costs of waste oil.
- **Melco Call Monitoring:** Useful for training call-handling skills. The supervisor can either listen to the trainee, or the trainee can listen and learn from experienced telephone representatives handling calls.
- **Meyer Steel Structure:** Pioneers in the design and application of tubular steel structures for voltages up to 765kV. Their line of structures includes products for utility, wind, lighting, communications, substation, and lattice towers.
- **Omni-PLUS Structured Cabling Solutions:** A fully integrated system offering network flexibility no matter what the application, speed or environment. Products include Patch Panels, Jacks, Plugs, Information Outlets, LAN Cable, Patch Cord, and more, as well as a complete fiber optic solution. Thomas & Betts can design an individualized solution from their extensive portfolio of products and services.

Thomas & Betts' wide range of products and services are available to you through McNaughton-McKay. Contact McNaughton-McKay to learn more from your friendly sales engineer.



Allen-Bradley Bulletin 800F Pushbuttons Meet World wide Product Standards

by Greg Denk
McNaughton-McKay Electric,
Greenville, South Carolina

Allen-Bradley's Bulletin 800F 22.5mm pushbuttons are designed and manufactured to meet your customer needs as well as the following world wide product standards:

- UL listed
- CSA rated
- CE marked
- RoHs directive-compliant

Using state-of-the-art modeling techniques and finite element analysis, each component in the 800F line is optimized for durability and safe performance.

Same Great Features as Bulletin 800E Pushbuttons:

- positive detent to ensure switching safety
- patented rotating latch collar for savings in installation time and cost
- superior materials to ensure product durability

Additional Features:

- spring-clamp contact blocks
- low voltage contact blocks
- illuminated e-stops
- customer laser engraving capability on caps and diffusers
- aesthetically pleasing lower product profile

Bulletin 800F pushbuttons have fewer SKU numbers than the 800E, which means less inventory to manage, with enough flexibility and variety to meet application-specific requirements.

If you want quick selection, superior design, and fast-mounting pushbuttons, contact McNaughton-McKay.



Allen-Bradley Expands Bulletin 800C Product Line



Allen-Bradley has expanded its Bulletin 800C product line to incorporate 8-, 10-, and 12-hole pendant enclosures and 12 additional operators, including selector switches, key-operated selector switches, a hole-closing plug, and colored push buttons. The enclosures are suited for crane, hoist, and general purpose material handling applications.

Features of the 800C Pendant Stations:

- Rugged, double-insulated enclosure can resist impact, chemical, and flame.
- Corrosion-resistant stainless steel hanger ring provides external strain relief.
- Flexible rubber cable sleeve can be cut to the appropriate cable diameter.
- Rubber boots offer water-tight (IP65) sealed buttons.
- Buttons are flush-mounted with the enclosure to reduce risk of accidental operation.
- One- and two-speed contacts offer optimal control.
- Finger-safe contact blocks are color-coded by circuit type.
- Laser-engraved universal directional arrows on button caps provide durability.

Special Features Available:

- Twist-release e-stop is standard on all pendants except the two-button.
- Ergonomic "pistol grip" design on the P02 and P03 pendants allows for one-hand operation.
- Unique green indicator on the P05 and P12 pendants changes to red when e-stop is actuated.
- Wire guides/traps on the P05 and P12 pendants contain wires within enclosure during installation.

For more information about the Allen Bradley Bulletin 800C product line, call on McNaughton-McKay. We're experts in optimizing automation



Hoffman Rack and Enclosure for Network and HVAC Housing Needs

Hoffman's heavy-duty open frame rack provides easy access for positioning and securing expensive networking equipment (LAN, WAN, phone and voice mail equipment, routers, and servers), while the Hoffman multi-purpose, large, Type 1 free-standing enclosure offers the perfect housing solution for PLC/main control panels, power distribution cabinets, and HVAC applications.



Heavy-Duty Open Frame Rack Features

- Designed for grouping with standard two- and four-post racks
- Available in seven- or eight-foot tall models
- Lightweight aluminum construction
- Open access on all sides for easy equipment access
- Vertical channels in the uprights to hide and manage loose cables
- Movable cable managers ease cable routing to front or back of rack
- Pre-drilled holes in base ensure secure fastening to the floor
- Ships flat for easy transport
- Includes all hardware necessary for assembly in either 19- or 23-inch configuration



Multi-Purpose, Large Type 1 Enclosure Features

- Designed for clean environments, where Type 1 protection is desired
- Available in 11 sizes
- Panel and rack angle component mounting alternatives
- Reversible doors with 3-point latch and padlocking handle
- Removable back covers for easy access to equipment
- Integral 10-gauge steel base for secure lifting with forklift or hand truck or bolting to the floor for secure fastening
- Lifting tabs to simplify overhead hoist transport and assist in stabilizing the enclosure during component mounting

Contact McNaughton-McKay for more information on quality Hoffman enclosures and racks.



McNaughton-McKay Partnering to Provide Economical Compressed Air Systems

by Mark McCann
McNaughton-McKay Electric,
Charlotte, North Carolina



A major supplier of compressed air systems has selected the ControlLogix platform and the RSLogix 5000 software from Rockwell Automation and Allen-Bradley to provide the control for their systems. The ControlLogix platform offers the maximum amount of control, security, and flexibility for future growth.

ControlLogix allows the compressed air control system the ability to control multiple compressors from the same or different manufacturers as one system, resulting in economical plant air. Flexibility is another key to the selection process. The ability to modify the control system to meet specific customer applications also led to the selection of the ControlLogix platform.

ControlLogix offers seamless integration with existing PLC-based communication networks, from serial to Ethernet/IP. This enables the systems provider to offer the industrial user the ability to transparently exchange messages with program processors on other networks. Finally, the different levels of security offered through the RSLogix 5000 software allows the provider to maintain the integrity of their control system while giving customers the ability to maintain and adjust the ControlLogix controller for specific plant needs.

For this major systems provider, the combined choice of the ControlLogix platform and the RSLogix software made a great deal of sense for all the above-mentioned reasons. McNaughton-McKay is pleased to have played a role in working with this provider to help put the pieces together.

For more information on these compressed air systems or other potential applications for ControlLogix products, please contact your McNaughton-McKay sales engineer.



Rockwell Automation Expands Computer- Based Training

McNaughton-McKay is proud to partner with Rockwell Automation to bring you an expanded portfolio of computer-based training (CBT) courses. These self-paced, self-directed training courses offer an ideal solution for manufacturers with time, travel, or budget constraints. CBTs allow employees to acquire and retain new skills at an accelerated rate; thus, more time is spent on the manufacturing floor and less time in a classroom. The Rockwell curriculum is designed to help increase employee knowledge, enhance skill sets and job performance, and improve overall productivity.

Studies show that self-paced training courses consistently result in higher retention rates than traditional instructor-led courses, when correctly implemented. Learners are able to absorb information at their own speed, they have full flexibility when “scheduling” the course, and are presented with the opportunity to check their knowledge as they go through the learning process. Students select the job tasks that are relevant to their product configuration and job requirements, whether training on a new concept or participating in refresher training.

The result? Minimal time away from the plant floor, maximized instruction time, and employees who have learned the required skills to successfully perform the tasks needed in their jobs.

Each RXTrainer 2000 computer-based course is carefully crafted, giving students detailed learning objectives and information on each task in the lesson. Helpful animations, background information, interactive quizzes, and links to other reference materials are frequently included. Various interactive software simulations may be used to

engage students throughout the courses and to reinforce learning. Students demonstrate their skills and test their knowledge by responding to different scenarios, or participating in question and answer sessions. In each case, specific feedback is given to the students, greatly enhancing their understanding of the material.

Talk with your McNaughton-McKay sales engineers about the full range of RXTrainer 2000 CBTs available. We can help identify which courses you need. Included in the course offerings are:

- ControlLogix Fundamentals
- Hydraulics
- Fundamentals of AD/DC Drives and Motors
- RSLogix 5000 Programming



Toughbooks from Panasonic Offer Mobility for the Open Road

For those of you who don't work at a desktop but still need the data management of a computer, Panasonic Computer Solutions offers a line of Toughbook computers that help take your work on the road. Each Toughbook has been designed using MIL-STD-810F test procedures; they can take whatever you throw at them. They resist drops, dust and moisture; the screen and case resist scratches. They offer a variety of Microsoft applications, depending on your needs.



Toughbook 01

To give you an idea of the wide variety, here are just a few of the available models:

Toughbook 01 is a hand-held, one pound model. The three by five reflective color frontlit LCD allows a choice of touch-screen or keyboard data entry. With 32MB SDRAM you can run Microsoft Windows CE 3.0 or choose Microsoft Pocket PC 2002 with 64MB SDRAM. The lithium ion rechargeable battery can run from eight to ten hours.

Toughbooks come wireless ready. Integrated options include:

- 802.11b Wireless LAN
- Wide Area Wireless Solutions
- Global Positioning System Receiver
- Bar code scanner

Toughbook 18



If you'd like something bigger, there's **Toughbook 18**. This innovative computer is a four and a half pound notebook that converts to a tablet with a simple twist of the 10.4" touch-screen. The CPU offers an ultra low voltage Intel Pentium M Processor, 900MHz with 1 MB on-die L2 cache. There's an 82-key keyboard, with a dedicated Windows key and pressure sensing touch-pad with vertical support.

Once again you have your choice of software. Choose Microsoft Windows XP Professional or Windows 2000 with on-line reference manual, Adobe Acrobat Reader, DMI Viewer, Panasonic Handwriting, Display Rotation Tool, and Hard Disk Data Erase Utility for the PC. For the Tablet, Microsoft Windows X Tablet PC is available.

The battery lasts four to six hours, depending on use and most of the same wireless options are available along with Bluetooth and SmartCard Reader. The Interface includes:

- Modem
- Network Interface Card
- Serial Port
- External Video
- USB 2.0 (x2)
- Headphones/Speaker
- Microphone/Line In

Finally, the nine-pound **Toughbook 28** has a full magnesium alloy case with carry handle, and added vibration resistant design. The CPU boasts a low voltage Mobile Intel Pentium III Processor-M 1GHz or 800MHz featuring Enhanced Intel SpeedStep technology. You can choose between the 13.3" 1024 x 768 (XGA) transmissive, anti-reflective, outdoor-readable TFT Active Matrix Color LCD with or without touch-screen or the 12.1" 800 x 600 (SVGA) transreflective sunlight-readable TFT Active Matrix Color LCD with touch-screen.

The Toughbook line of computers is powerful, rugged, wireless, and convenient. Take them with you into the field whether your business is industrial, law enforcement, or military and know they'll stand the test of time with the reliability of Panasonic. For more information on these and other models, call McNaughton-McKay.

Toughbook 28



Bussmann Comprehensive Electrical Plan Review

McNaughton-McKay has partnered with Cooper Bussmann, a leading worldwide manufacturer of electrical products, tools, and hardware, to bring you valuable training and reference materials. We highly recommend the reliable and robust educational manual - Cooper Bussmann's Electrical Plan Review. It contains comprehensive, in-depth information designed for professionals in the field, including electrical inspectors, electrical contractors, plan examiners, and consulting engineers. Using this manual as a training tool will give people the ability to understand important overcurrent protection considerations related to:

- NEC requirements
- Short-circuit currents
- Ratings (voltage, ampere, and interrupting) of overcurrent protection devices
- Sources of short-circuit currents
- Short-circuit current calculation methods and example problems
- Current limitation and use of let-through charts
- Applying current-limiting devices to protect downstream components
- Series rated combinations
- Selective coordination
- Maintenance and testing considerations
- Grounding and bonding of service equipment
- Data log-in letter and form
- Series combination rating inspection form
- Series rated combination charts by manufacturer (available online only)

As always, we strive to offer you valuable tools that provide practical business solutions. In addition to the Electrical Plan Review, an extensive, virtual library of online training is available for your use. At

www.bussmann.com, you'll find a comprehensive list of online and downloadable presentations. Some of the training courses play online and include audio and video; others are presented in well-designed PowerPoint formats, accompanied by a printable script. Industry trainers are strongly encouraged to take advantage of the opportunity to use these materials in their sessions.

The wide range of subject matter includes over twenty offerings related to the NEC and overcurrent protection, as well as presentations on an assortment of telecommunications topics. These exceptional tutorials are well-planned and easy to follow.

Contact McNaughton-McKay for more information on Bussmann products, solutions, and services.



Panduit Pan-Steel System for Self-Locking Stainless Steel Ties

Panduit Pan-Steel System for vehicle applications offers ties engineered to outlast the roughest and most destructive elements. Their advantage is in the unique self-locking head design. It has special features that enhance overall performance, such as:

- An aggressive locking head allows quicker locking and tighter installation.
- The exclusive lead in design provides a wider entrance for easier threading.
- A displacement lock assures superior locking strength.
- An extended retaining tab increases the overall tie strength.
- The locking ramp assures locking in any position.
- Finally, the strengthening ribs make for a stronger head that increases lock strength.

The Enhanced Pan-Steel Wave-Ty Self-Locking Stainless Steel Cable Tie sports a unique waveform spring which maintains greater installed tension on non-resilient objects. With a loop tensile strength of 200 pounds, the Wave-Ty provides superior strength and increased performance. Type 304 and 316 stainless steel will stand up to all sorts of harsh environments.

When you need protective coating and a smooth surface, there's also the Enhanced Patented Nylon 11 Selectively Coated Ties. With the strength of steel and the protection of nylon, these ties have a loop tensile strength of 120 pounds. The Nylon 11 coating thickness of .002 inches per side is resistant to chemicals and salt sprays, halogen-free and good in temperatures from 40°F below to 285°F. The 316 grade stainless steel adds to the overall strength and resistance of this product. It's perfect for communication and electrical cables.

The Panduit Pan-Steel System line of ties, available from McNaughton-McKay, offers all you'll ever need.



Allen-Bradley Controller Offers Increased Networking Options

by Donny Bartlett
McNaughton-McKay Electric,
Greenville, South Carolina

Allen-Bradley's CompactLogix 1769-L35E Controller is now faster and more powerful. Expanding I/O memory up to 1.5 MB increases module and network options and provides programming versatility, supports high-speed applications, allows faster scan times and updates, and enables high-speed data throughput while supporting up to 32 simultaneous HMI and I/O connections.



Easy modular design allows users to slide on the right number of Compact I/O modules to meet application needs. The rackless design of the CompactLogix controller is DIN rail- or panel-mountable. This compact design provides space savings of 20%-40% over traditional mounting styles. The high-performance serial bus and removable terminal blocks provide greater configuration, flexibility, reduced inventory requirements, and easy module assembly and replacement.

Features also include:

- advanced diagnostic and data monitoring capabilities via Ethernet and Web interfaces
- support for advanced Web features such as e-mail
- support for up to 64 devices through a DeviceNet network interface.

CompactLogix uses the same Logix control engine shared by ControlLogix, FlexLogix, and SoftLogix.

CompactLogix also uses the same Rockwell Software RSLogix 5000 programming software as other Logix platforms so users can easily move from one application to the next without additional training and development.

Not sure of the best Allen-Bradley controller for your application?

Contact your sales engineer at McNaughton-McKay. We're experts in optimizing automation.



Rockwell Safety Compliance Products

by **Tim Mulcahy**
*McNaughton-McKay Electric,
Madison Heights, Michigan*

"The cost of an accident, in terms of legal action - including possible fines and lost production- will greatly outweigh the costs of purchasing and installing safety equipment." -Derek Jones, EJA Ltd.

Rockwell Automation continues to engineer safety-promoting presence sensing technologies. State-of-the-art products that address safety compliance include the Allen-Bradley Guardmaster

Guardshield Safety Light Curtains and SafeZone Safety Laser Scanners.



Guardshield Safety Light Curtains Bulletin 440L GuardShield Type 4 safety light curtains offer full-featured point of operation control as well as perimeter and area access guarding. Its torsionally rigid extruded aluminum housing and IP65 Environmental Rating have been designed to live in tough industrial applications. This self contained two box safety light curtain has dip switch selectable operating modes that allow for easy setup to accommodate your needs. Key features include:

- Two box light curtain (no need for an interposing transmitter / receiver control box)
- Optically synchronized transmitter receiver (not matched pairs)
- 24VDC
- Two PNP safety outputs (500ma)
- One PNP non-safety auxiliary (500ma)
- Protective heights: 320 mm to 1760 mm, in 160 mm increments

- IP 65
- Beam spacings: 10 mm for 14 mm resolution; 20 mm for 30 mm resolution
- Fixed Blanking - Teachable
- Floating Blanking - one or two beam
- Beam coding
- EDM external device monitoring
- Uses standard 4 and 8 Pin DC micro change interface cables

McNaughton-McKay sales engineers can best describe the advantages of beam coding, (EDM) External Device Monitoring, machine test signaling, start /restart interlocking and how they help in specific applications.

SafeZone Safety Laser Scanners

The Guardmaster Type 3 SafeZone Safety Laser Scanner is an Area Access Control device that senses the presence of a person or object within a defined area. This is accomplished by using a diffuse reflection of emitted infrared light generated by a Class 1 (eye safe) laser. A Safety Zone area and a

Warning Zone area can be configured with the Allen-Bradley Safety Configuration and Diagnostic software. This password-protected Windows-based software will allow the user to configure areas that may be of irregular shape with the click of a mouse. Simply click the mouse and drag points along the perimeter of the intended zone to shape the contour of your application.

The SafeZone has a maximum 7.5 meter (300° Peripheral Vision) scanned field and provides one relay output for warning and two independent safety relay outputs for equipment shutdown. The device may be mounted horizontally for a defined protection zone, vertically for whole body access detection, or in mobile safeguarding applications on automated guided vehicles. In all applications the programmable warning zone may be configured out to 7.5 meters and the protected safety zone to 6 meters.

In the automated guided vehicle application, all objects — fixed or moving — are detected. A Safezone warning alarm is initiated as the AGV approached a person or unintended obstruction. The AGV will stop immediately if the inner protected safety area is penetrated or obstructed.

Vehicle speed largely determines the size of the protected area.

Allen-Bradley Guardmaster devices are supported with a complete range of safety relay interface modules including the MSR 200 Expandable Safety System. This Safety Relay Series allows the user to configure the number of inputs and outputs needed to match a specific application requirement, as well as increase diagnostic and network interface capabilities. Up to 10 input modules and 2 output modules can integrate multiple types of devices into a single relay block with "plug and play" flexibility for complex systems, including Safety Light Curtains / Mats, and other devices also available from Allen-Bradley Guardmaster.

Allen-Bradley and McNaughton-McKay are working together to bring safety products to the production floor. If you have questions regarding these safety products or other safety issues, please contact a McNaughton-McKay sales engineer today.



Allen-Bradley ElectroGuard Safety Isolation System

by **Bill Townsend**
*McNaughton-McKay Electric,
Madison Heights, Michigan*

The importance of safety in the workplace cannot be overstated...or overlooked. McNaughton-McKay brings you the Allen-Bradley ElectroGuard Safety Isolation System, unmatched in the industry. Particularly noteworthy is its ability to isolate both electrical and pneumatic energy in one swift action.

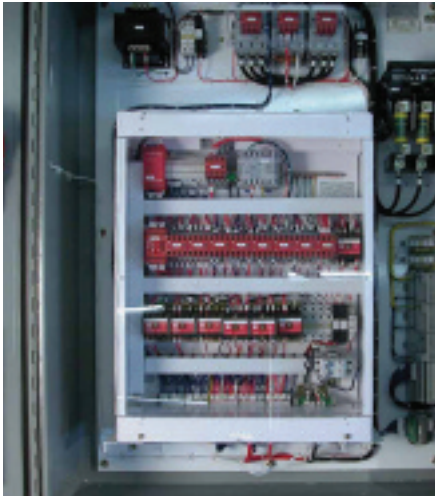
The ElectroGuard system's approach to hazardous energy isolation greatly enhances the ability of operations and maintenance personnel to properly perform lockout/tagout procedures, which leads to greater assurance of compliance, and improved productivity. The benefits include:

- Simplification of lockout/tagout procedures

◆ *Continued on next page*

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- Reduced workplace injuries
- Cost-effective compliance with OSHA requirements
- Improved productivity
- Use of a standard procedure throughout your facility
- Modular construction, resulting in quick installation and ease of specification, purchasing, setup, and maintenance
- Longer cycle life than with electrical disconnects



How does it work? The entire sequence takes less than 10 seconds, and works like this:

- First, the Remote Lockout station initiates the isolation sequence (an operator turns the handle from the ON to the OFF position).
- Next, the ElectroGuard system is placed between the energy source and the machine. The Control module controls and verifies the system function. It sends and receives signals from the Electrical Isolation module, the Pneumatic Isolation module, and the Remote Lockout stations. At any time, if the ElectroGuard panel ground is lost, the system will isolate the energy and fault. Or, if any fault occurs within the system, it will also result in an isolation. The ElectroGuard system is powered by a 120V control transformer in the main panel and 24VDC power supply within the Control module. All external modules are powered from the main panel, and are low voltage signals, 24VDC.
- Then, after successful isolation, the Control module illuminates the operator's Remote Lockout station "system isolated" light.

- Finally, the operator applies their lockout/tagout lock to the Remote Lockout station handle, and can safely work on the machine.

Factory options for the system include:

- Remote lockout station
- Branch circuit protection (with fused disconnect or circuit breaker)
- Communication modules (providing system status information for network connectivity)
- Time delay (with a provision to incorporate a machine cycle stop with the actuation of the remote lockout station)
- Expansion modules (NEMA type 1 or type 12; 4 port expansion; and 10 port expansion)
- Cover-mounted metering (single- or three- phase voltmeter and ammeter; others can be customized)
- Pneumatic Isolation module

The ElectroGuard system enhances the safe workplace practices by providing a single-point lockout for all sources of energy, in order to reduce the chances of one energy source being overlooked. It offers pre-certified compliance to the highest safety level, ensuring a fail-safe system and a safer workplace. It's modular, for quick and easy maintenance, and factory-sealed for system integrity. It also includes low voltage remote lockout stations and a power panel and certification to safety Category 4. This system gives you the ability to have a complete solution in a flexible, maintainable, and cost-effective system. Using the ElectroGuard system establishes a uniform energy isolation process for all stations and all sites.

Contact a McNaughton-McKay sales engineer for more information on the ElectroGuard Safety Isolation System. Also available is a booklet of Frequently Asked Questions. It contains comprehensive questions and answers, including those both commercial and technical in nature. From the type of applications the ElectroGuard is suitable for, to why Category 4 is important, to retrofitting, this booklet contains a wealth of information.



Know the Risks of New Equipment

Do you know what possible hazards exist for that new piece of equipment coming in next week? How do you minimize the potential risks of injury or illness?



A good place to start is having a strong safety committee dedicated to calculating risks and creating safety plans. Your safety standards should contain quantitative methods for determining the possible hazards involving processes or machinery. The International Electrotechnical Commission (IEC) is a European standards-setting organization that developed IEC 61508, including standards for safety-instrumented systems for all industries; IEC 62061, defining standards for machinery; and IEC 61511, covering standards for process industries...among others.

You can lower the risk of new equipment hazards by reducing the possibility that an event will occur. Performing a risk analysis does not guarantee that nothing will happen, but knowing the methods of hazard prevention will minimize the risk. For more information regarding risk assessments and safety standards contact McNaughton-McKay, or check out the following websites:

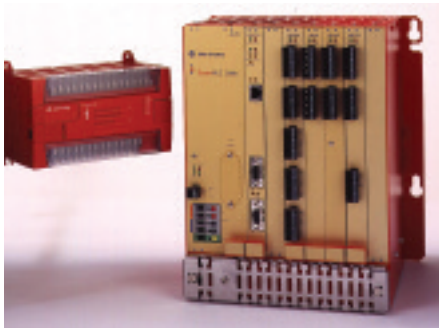
www.ansi.org
www.isa.org
www.robotics.org
www.triconex.com



The Logic Behind Allen-Bradley Safety PLCs

Allen-Bradley offers yet another way to increase safety and savings with the Guard Safety Programmable Logic Controller (PLC) line.

The Guard Safety PLC line uses identical CPUs and built-in self-monitoring hardware and diagnostics. The identical CPUs allow one processor to perform a safety function, such as bringing the system to a safe state, when a fault is detected in the other processor. This line is configured specifically for fail-safe applications.



Why use a safety PLC? Safety PLCs are less prone to nuisance trips, which can shut down operations unnecessarily. And, safety PLCs enable quick troubleshooting, so you have less downtime. Eliminating nuisance trips and decreasing downtime results in increased productivity and increased savings. Standard PLCs have been configured for safety applications, but doing so requires additional engineering time, hardware, wiring, and custom software. Allen-Bradley safety PLCs have everything built-in.

Increasing industry standards is another reason to use safety PLCs. Three organizations currently require stringent standards for safety PLCs: TUV (Germany), Factory Mutual (USA), and Health and Safety Executive (UK). Safety PLCs meet the standards by using highly reliable power supplies that are designed to fail predictably.

Does your application require a safety PLC? Let McNaughton-McKay help you find logical solutions for your safety and savings needs.



Thomas & Betts Website: A Triumph in Information Organization

The Thomas & Betts website is a triumph in arranging massive amounts of information into accessible links. The home page, found at www.tnb.com is a metaphor for Thomas & Betts' boast of being "invisible to the consumer." Just as their electrical product lines are usually installed in the walls and wiring of buildings, the Home Page is deceptively simple and unsophisticated, but click on any one of the links and you're instantly transported to an amazing array of information at your fingertips.

The site offers information in various formats. You can find the latest in investor and stock prices, product catalogs, or even inventory at participating distributors. The FAQ is informative and helps point you in the direction you want to go. There are separate links for:

- Electrical Products (the most complete of the websites);
- Utility Products (latest products, ordering and brand information);
- CATV and Telecommunications (competitor search, product search);
- HVAC (Link to Reznor website);
- Melco Call Monitoring (ordering information for this product);
- Meyer Steel Structure (direct link to Meyer website and all product info);

- Omni-PLUS Structured Cabling Solutions (link to pdf files of product information); and
- The Thomas & Betts Canadian website (an informative website, available in English or French. The information is similar but presented differently.)

Most of these websites have added "extras" like links to associations, brand names, and other information.

One of the most enjoyable aspects of this website is the varying levels of information. Already an expert and know what you want? Jump straight to "Brand Lookup" or "Catalog/UPC Lookup" and enter the product you're looking for to get straight to ordering. You can even enter a competitor's catalog number in "Competitive Cross Reference" and the site will find you a match. Want more information about different uses and options? You can run a search based on criteria provided of what you need and the site will help you find the perfect fit. Looking for that wall thingy that fits in the plug? Try the interactive site under "About T&B" that lists the market applications. A particularly clever page, it invites you to click on links to see these products in use in the Industrial, Residential, Commercial or School markets. One click brings up a diagram of each location with click-on pop-ups to explain products, brands, and locations.

There's a great sense of humor, as well. One link, "About Cable Ties" pictures an alligator with his jaws held shut by a cable tie. Next to it is a link "About Gators;" sure enough there's some encyclopedic information about alligators with a link to a resort website that features them. The link on cable ties has historic information presented in a lively manner as well.

Overall, the Thomas & Betts website seems to strive to meet the needs of consumers, investors, and web surfers with a little bit of everything. And, just like the Thomas & Betts product line, the website seems to tell you, "If you want it, we've got it!"



Thomas & Betts

Control Chief: Creating Successful SLC Solutions Using Wireless Communications

Control Chief (Rockwell Automation Encompass partner) offers two products that work hand-in-hand to provide wireless communications for your SLC system: the Communicator and the Safety Watchdog modules.

The Communicator is a high-performance SLC platform with all the features required to make wireless remote applications more efficient, flexible, and reliable. The Communicator is also easy to configure and expand. Key features of the Communicator include:

- No FCC site license required (wide band modules)
- Supports narrow and wide band communications
- Data rates up to 115.2 Kbps with 2.4 GHz wide band
- Superior range to 802.11 wireless LAN devices
- Easy to configure from Allen-Bradley's I/O configuration window along with front panel DIP switches
- Four easy-to-read front panel diagnostic LEDs:
 - Link Status
 - Receive Data
 - Transmit Data
 - Module Fault
- Compatible with all SLC-500 Modular CPUs
- Base/remote topology supports up to 255 nodes

Control Chief's Safety Watchdog Module for the SLC 500 series provides protection from SLC hardware and ladder program failures in wireless remote control applications. The Watchdog puts safety first with its associated hard-wired safety circuits. The module provides 10 amp, Normally Open, isolated relay contacts to interface to the Main Line Contactor (MLC) of the remote controlled machinery. These circuits are strictly maintained by monitoring flawless operation of the SLC500 CPU and application specific ladder logic program.



The Watchdog module is designed specifically to work with the Communicator, to achieve a true "Fail Safe" operation. The safety emergency shutdown circuits enable real-time control. Control Chief Corporation is the only company that can tightly integrate RF techniques into a PLC platform with reliability and safety levels appropriate for wireless control of critical operations.

The Communicator is also the first wireless communication module to be tightly integrated into the Allen-Bradley SLC 500 Programmable Logic Controller (PLC). The Communicator module communicates with the SLC CPU directly over the SLC backplane instead of via serial ports. Previously, when using these products in wireless remote control applications, questions have been asked about the use of safety emergency shutdown circuits and their integration into PLC-based systems. The Communicator and Safety Watchdog modules when used in tandem answer those questions, while also satisfying international safety standards.

How is this feat accomplished? The Watchdog module monitors the operation of the PLC CPU and application program and provides direct control of the

remote machine's MLC/MCR circuits. This creates a true wireless remote control system with operational characteristics of a dedicated wireless remote control, but the SLC still has the ability for the application program to be written locally without compromising system integrity or safety. Multiple watchdog timer circuits in the Communicator module and Watchdog module work together to monitor operations and generate automatic interrupts while protecting against catastrophic failures within the Communicator module.

The Safety Watchdog module has two configuration options.

- A single MLC/MCR control circuit using two relays with output contacts connected in series. This module is also equipped with six additional outputs, all of which are contact rated for 120 VAC 10A resistive.
- Dual MLC/MCR control circuits where each watchdog output relay is individually isolated. This module is designed to interface with MLC/MCR safety relays designed to comply with the harmonized European Standard EN954-1. This module is also equipped with six additional outputs, all of which are contact rated for 120 VAC 10A resistive.

Control Chief's Communicator and Safety Watchdog modules open new performance capabilities by using the versatility of the SLC 500 platform in true wireless remote control applications. The tight integration allows additional levels of operational security to be provided in a manner similar to dedicated wireless remote control systems, essentially turning the SLC platform into a powerful wireless remote control.

Contact McNaughton-McKay to learn more about Control Chief's Communicator and Safety Watchdog.





Cable Ties and Wiring Accessories Catalog from Panduit

Panduit's Cable Ties and Wiring Accessories Catalog offers a wide range of products to fill any wire bundling, mounting application or abrasion protection need. This handy catalog offers thousands of items providing the most innovative offerings in the industry, including:

- nylon, hook & loop, and stainless cable ties
- installation tools
- wiring accessories, and
- abrasion protection products.

Other Panduit products featured include:

- CONTOUR-TY Cable Ties with low profile head and smooth, round edges.
- UL Listed TAK-TY Hook & Loop Cable Ties for use in air handling spaces.
- PAN-WRAP Split Harness Wraps for improved harness protection.
- PAN-CLAMP Heavy Duty Fixed Diameter Clamps with integrated fasteners.

Panduit's catalog also includes a material selection guide for each Panduit product family, providing a quick and easy reference when ordering. Don't be without this catalog next time you need cable ties and wiring accessories; contact a McNaughton-McKay sales engineer and get a copy of the Panduit Cable Ties and Wiring Accessories Catalog.



www.mc-mc.com

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