

Industrial Automation

Comprehensive Solutions
from Panel to Plant



PANDUIT®

building a smarter,
unified business foundation

Connect. Manage. Automate.



Panduit's Unified Physical Infrastructure (UPI): a Guiding Vision

A unified approach to physical and logical systems architecture is imperative for solutions to fully address the need for availability, agility, integration, and security.

Panduit has developed the industry's most comprehensive and holistic approach to a Unified Physical Infrastructure and can help enterprises align, converge, and optimize critical systems – communication, computing, control, power, and security – to build a smarter, unified business foundation.

Unified Physical Infrastructure



Industrial Automation Solutions

Panduit is a global manufacturer of leading-edge solutions that help our customers connect, manage, and protect physical media. Our full range of product systems, tools and services are aligned by the Unified Physical InfrastructureSM (UPI) approach to enable distributed systems, improve availability, and increase operational efficiency.

Whether the solution is for electrical, networking, or control systems, Panduit is uniquely qualified to understand the complexities of plant-level networks and controls. From monitoring production processes to optimizing pathway design, our Industrial Automation Solutions ease the deployment of industrial networks and automation control systems to enable expansion of operations, increase collaboration, and enhance productivity.

Panduit solutions are easy to install and offer maximum durability in the most hazardous conditions, helping manufacturing stakeholders to:

Reduce Risk

- Meet and exceed the most recent industry/international standards through rigorous component and system performance testing
- Utilize a multi-layered approach for more effective physical network security
- Enhance workplace and operator safety

Maximize Performance

- Meet greater performance requirements, perform quick and reliable installations, and achieve fast, easy maintenance and repair operations with a comprehensive portfolio of innovative products and solutions
- Leverage existing network assets/investments to reduce project/installation costs, and maximize ROI



Improve Reliability, Security, and Safety

The physical infrastructure forms the foundation that creates and supports the power and communication channels connecting a distributed system. These systems are tasked with the demands of real-time control, process data collection, and device configuration. Each element of the physical infrastructure must be designed and deployed to ensure that each industrial network channel remains reliable with sufficient performance margin, proper environmental rating, and with the foremost security features.

Innovations From Panel to Plant

Panduit delivers system expertise and innovations that improve reliability, security, and safety while reducing operating costs. Panduit is the industry's premier single-source supplier of complete physical infrastructure solutions to enable Industrial Automation systems. Targeted to specific plant needs, Panduit's Industrial Automation Solutions are comprised of 5 core solution groups:

IN-Panel (Control Panels, Electrical Panels, MCC)

Panduit has pioneered with innovative products and complementary tools that mitigate disruptions due to electrical/mechanical noise, to ensure reliable system performance and maximize valuable real estate pages 4-9

IN-Field (On the Machine, In the Process Areas or Outdoors)

Panduit leads the industry with delivering distributed automation products that withstand demanding environmental conditions such as high vibration, caustic chemical vapors, washdown, and radiation, while reducing repair and replacement costs..... pages 10-15

IN-Route (Industrial Pathways and Network Zone Enclosures)

Panduit offers both open and enclosed methods for routing cable, as well as hybrid solutions that reduce installed costs and improve the time/effort for moves, adds, and changes (MACs). Network Zone Enclosures provide real estate savings and performance benefits of a zone cabling architecture.....pages 16-19

IN-Room (Control Room, Data Center, Telco Closet)

Panduit delivers a complete infrastructure to support dedicated manufacturing servers/switches and enable DIN mounted devices to be co-located, increasing productivity with a Micro Data Center solution..... pages 20-23

IN-Frastructure (Power Distribution, Lighting, HVAC, Security, Safety)

From deploying power to grounding strategies that achieve lowest TCO, while protecting your workforce and securing your network assets, Panduit is committed to help you achieve excellence.....pages 24-31

Panduit's Industrial Ethernet Physical Infrastructure Reference Architecture Design Guide

Panduit has collaborated with other industry leaders to address deployment complexities associated with Industrial Ethernet. This has resulted in the *Industrial Ethernet Physical Infrastructure Reference Architecture Design Guide* for designing, deploying and managing the physical infrastructure for an Industrial Ethernet network.

The Guide bridges the gap between IT terminology and control theory to assist in the convergence of distributed systems. It is intended to provide a structured approach for architects, designers, controls engineers, and IT professionals – to enable consistent deployment of sustainable IT infrastructures.

To request a copy of the Guide visit us at:
www.panduit.com/IA

UL and CSA Listed Compression Power Connectors for Code and Flex Cable

Available in a broad range of styles and sizes.



New Lithium-ION Battery Powered Crimping Tools: CT-3001

Provides up to 135% more crimps per charge and up to 30% faster cycle time.



Cable Cutter: CCT-320

Designed with optimal force transmission ratio and stepwise cutting to allow for one-hand operation.



UL and CSA Listed Mechanical Power Connectors for Code Cable

Designed to be reusable and installed without special tooling.



UL and CSA Listed Terminals and Disconnects

Designed and manufactured for fast assembly and reliable performance.



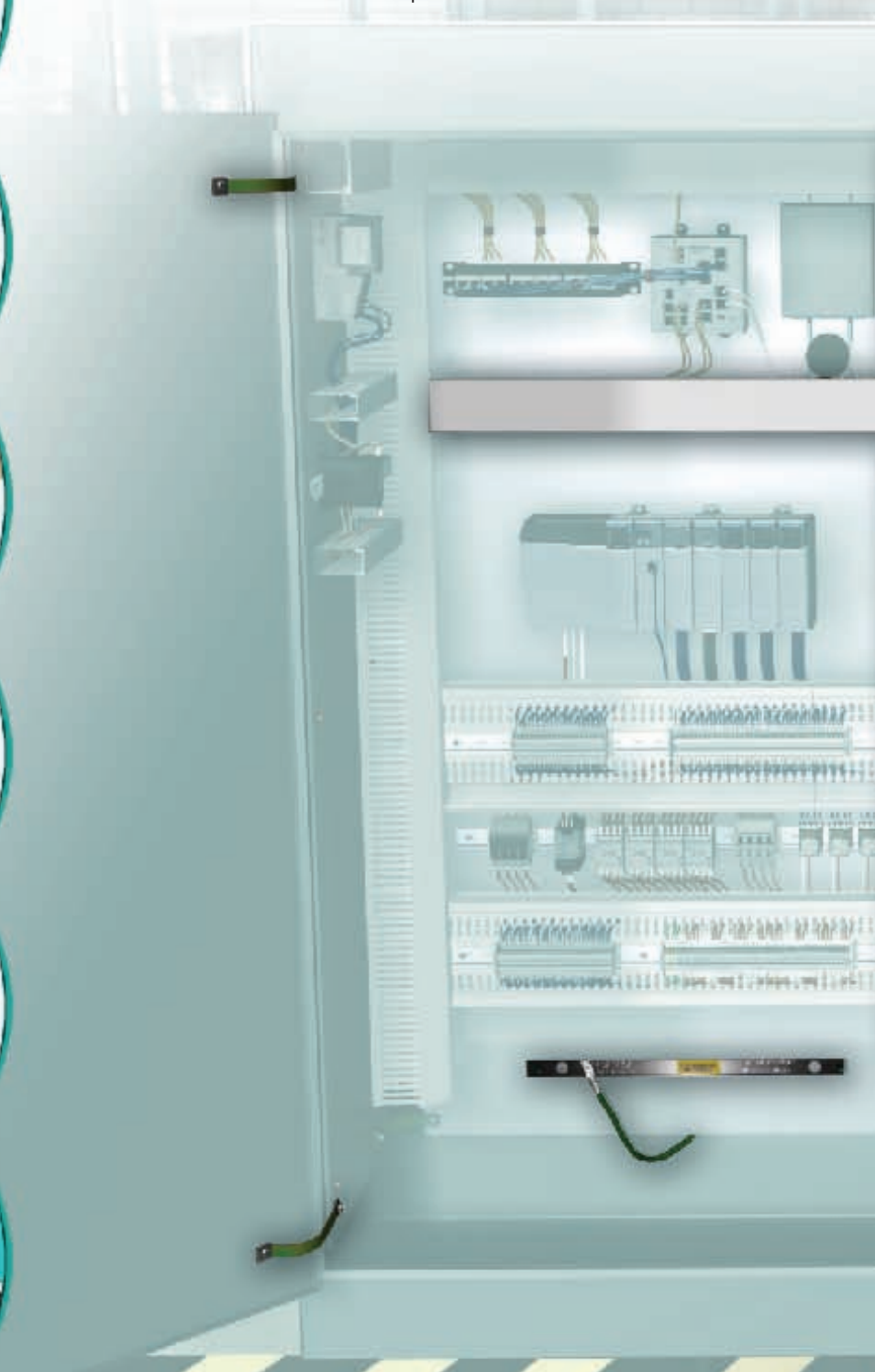
Contour Crimp™ Controlled Cycle Tool: CT-1550

Ergonomically designed.



Success *Does* Depend on the Crimp

Your control panel design begins with power, and there is no better way to start than with Panduit's reliable termination system of connectors, dies and installation tools. At Panduit we believe that success depends on the crimp, which is why we offer a broad selection of termination solutions for code and flex conductors that meet UL 310, UL 486A-486B, as required by the latest UL 508A standard for industrial control panels.



*Your customer is counting on what's inside
– Trust Panduit.*

Techniques for Noise Mitigation

Color-Coded Duct – Manage control panel wiring by using black color duct for noisy power cables and white color duct to identify low voltage network cables.

Noise Shield – Up to 20dB noise coupling reduction enhances noise mitigation and can reduce air spacing requirements between cables.

Braided Bonding Straps and Bonding Hardware – Reduce the effects of electromagnetic interference (EMI) and promote better electro-mechanical compatibility (EMC).



UL and CSA Listed Braided Bonding Straps:
BS100445
BS100445U
BS201246EU

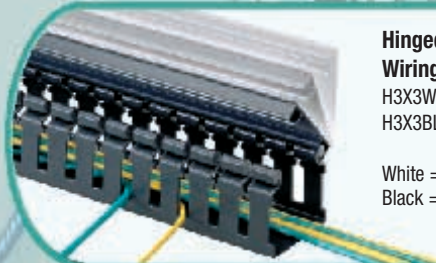


Grounding Busbars and Bonding Hardware:
RGRB19U
RGTBSG-C
RGW-100-1Y
TRBSK



Plenum Rated Hook & Loop Cable Ties:
HLTP21-X12
HLTP21-X0

Delivers reliability by protecting against over-tensioning high performance cables.



Hinged Cover Wiring Duct:
H3X3WH6, HC3WH6
H3X3BL6, HC3BL6

White = clean pathway
Black = noisy pathway



PanelMax™ Noise Shield:
SD3EMI

Installed separately or within wiring duct.



Slotted Grommet Edging Adhesive Lined:
GEE99F-A-C

Provides cable abrasion protection and harnesses cables into a single bundle.

Increase Control Panel Space Savings

Wiring can dominate a control panel, pushing wireways to the limit and consuming panel real estate, which is always at a premium. Panduit's innovative PanelMax™ DIN Rail Wiring Duct **reduces control panel space by up to 30%!** This leaves you the option to lower your panel cost or reserve the space savings for future expansion.

PanelMax™ DIN Rail Wiring Duct: DRD33LG6

Up to 30% space savings vs.
conventional duct/rail layouts.



PanelMax™ Corner Duct: CWD3LG6

Up to 20% space savings
in layouts with side
and back panels.



Dynamic Cable Manager: ABDCM30-A-C ABDCM30-AV-C (use with) PLT2S-C

Provides strain relief at the hinge
of control panel door to extend
service life.



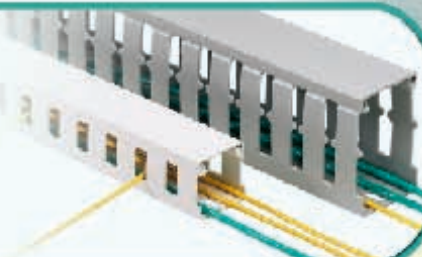
Adhesive Backed Cable Tie Mount: ABM2S-A-C ABMM-A-C (use with) PLT2S-C

Reliable adhesives for maximum
dependability in the panel.



Halogen Free Wiring Duct: NNC50X75LG2

Up to 203°F (95°C)
operating temperature.



*Your customer is counting on what's inside
– Trust Panduit.*

Cut-Strip-Terminate All In One

A best practice for control panel installation is using ferrules to avoid stray wires that are especially troublesome in high density terminal blocks. Panduit's strip-fed ferrules are engineered to be used with Panduit's CT-1000 tool that cuts, strips, and terminates for cost effective installations and high quality connections.



Ferrule End Sleeves:

Control stranded wires in terminal blocks providing superior termination performance.

Pin Terminals



Semiautomatic Ferrule Crimping Tool: CT-1000

Wire cutting, stripping, ferrule termination, and dispensing all in one tool for quick and easy installation.



Spiral Wrap:

T50F-C

Provides cable abrasion protection and harnesses multiple cables into a single manageable bundle.



NEW!

Hand-Held Thermal Transfer Printer with QWERTY Keyboard: LS9Q

Keypad design similar to smart phones for faster, easier typing.



Control Panel Switch Cable Tie Mount:

CPM122S-C
CPM875S-C
(use with) PLT2S-C

Provides strain relief behind control panel buttons.

Copper Jack Modules

Available in shielded and UTP Category 6A, 6 and 5e options for keyed and non-keyed applications.



Patch Cords

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.



Patch Panels

Modular versions accept all Mini-Com® Modules. Punchdown versions available in Category 6A, 6 and 5e options. High density versions and optional angled design assist in managing valuable panel space.



Pre-Terminated Fiber Patch Cords:

FXE10-10M* Y

Available in a variety of standard and custom lengths.



Fiber Optic Connectors (LC, keyed LC, SC, ST, FJ jack modules, and plugs)

Available in pre-polished (Opticom™ connectors) or field-polished.



Fiber Slack Manager:

FMS1
FMS2



Spool provides for organization of fiber cords in a variety of applications.



Enable Your Network

A recent study from ARC* indicates that 85% of all new industrial network installations are Ethernet based. Driving this trend is the wide variety of choices for cable and connectors (copper, fiber and wireless). Panduit has the ability to help you connect, manage, and protect the network inside the control panel. From pre-terminated patch cords to Turn-Tell® Labels, Panduit has products, tools and methods that ensure the network works right.

*ARC is the premier provider of market analysis, forecasts, and strategic reports for the full range of enterprise applications, plant systems, and automation solutions.



*Your customer is counting on what's inside
– Trust Panduit.*

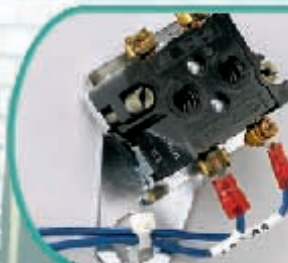
Future Proof Your Network

With proper slack management, existing fiber cable can be properly stored to allow for new potential terminations that can increase the speed without having to deploy or install new cable. Data access ports have field installable ports, to add new network connections within the existing housing. Panduit's 12 port patch panel can be reinstalled with color-coded jacks or keyed jacks when needed.



Network Security Lock in/Blockout:

PSL-DCJB
PSL-DCPL
PSL-DCPLR
PSL-LCAB
FLCCLIW-X



Funnel Entry Fork Terminals:

PV18 Series
PN18 Series

For use with panel switches.
Available in metric sizes.



Raised Panel Labels:

C120X150APT-22
C120X190APT-22
C180X180APT-30
C200X100APT



Data Access Port with GFCI and Category 5e Coupler:

IAPNG5EWH

Modular solution accepts
all Mini-Com® Modules for
design flexibility.



Hook & Loop Cable Ties:

HLT2I-X0
HLT2I-X6
HLT2I-X10

Delivers reliability by protecting
against over-tensioning high
performance cables.



NEW! Turn-Tell® Labels

Self-Laminating Labels

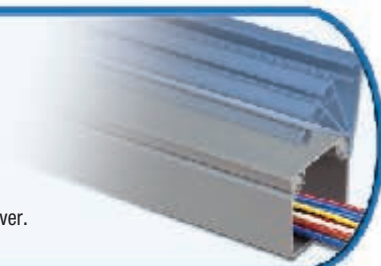
Heat Shrink Labels

Marker Plates

Hinged Cover Solid Wall Raceway:

HS2X2LG6NM
HC2LG6

Reduces the time and hassle associated with removing and reinstalling traditional raceway cover.



Pan-Ty® and Barb Ty Cable Ties:

PLT2S-C0
BT2S-C0

Broad selection of cable tie sizes, materials, and colors available.



Manual Cable Tie Installation Tool:

GTS
GTH

Engineered to promote worker safety, reduce downtime and provide lowest installed cost.



Corrugated Loom Tubing Solid Wall:

CLTS38F-C

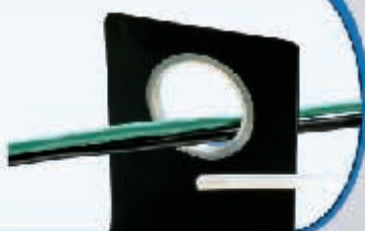
Provides cable abrasion protection.



Slotted Grommet Edging – Nylon:

GEE71N-C

Up to 65°C (149°F) operating temperature.



Pan-Wrap™ Split Harness Wrap:

PW75F-C20

Patented slot pattern provides improved flexibility and cable abrasion protection with minimal installation time.



For Tough Applications

Moving controls from inside a control panel onto the machine generates several notable benefits including reduced panel footprint, line-of-site diagnostic capabilities, and reduced field wiring. However, the cable that is run along, around, or on top of a machine still needs to be managed and protected. Panduit abrasion protection, bundling and labeling products keep the machine wiring intact and trouble free.

Use solid wall hinged raceway and corrugated loom tubing to contain and protect cordsets; both are lightweight, easily installed, and blend easily along or underneath machinery such as a conveyor system. Metal detectable cable ties are a perfect fit for food & beverage or consumer goods. Pan-Wrap™ Split Harness Wrap comes in a variety of colors and materials to help route different cables on a similar path.

*When the front line delivers to the bottom line
– Trust Panduit.*



Heavy Duty Insulated and Non-Insulated Ring Terminals:

PN12, PV12 and P12 Series

56% thicker material than standard terminals.



Flexible Adhesive Lined Heat Shrink Tubing:

HSTTV19-48-Q

Damp shrink applications.



Heat Shrink Labels

Self-Laminating Labels

Marker Plates



Braided Expandable Sleeving:

SE50P-DR0

Highly flexible cable abrasion protection.



Hand-Held Thermal Transfer Printer with QWERTY Keyboard:

LS8EQ

Keypad design similar to smart phones for faster, easier typing.



Screw Applied Cable Tie Mounts:

TM2S6-C0

TM3S8-C0

Available in a broad selection of materials, sizes, and styles.

IN-Field – Rugged

Cable Ties and Mounts:

PLT4H-TL120
PLT2S-M100
TMEH-S10-C100

Chemical- and weather-resistant materials.



Metal Detectable Nylon and Polypropylene Cable Ties and Mounts:

PLT2S-C186
PLT4H-L186
TM2S8-C186

Detectable by metal detectors and x-ray equipment.



Cable Tie Installation Tools:

GTS
GTSL
GTH

Provide consistent results and speed installation to reduce installed cost.



Weather Resistant Nylon Marker Plates:

MP175-C0

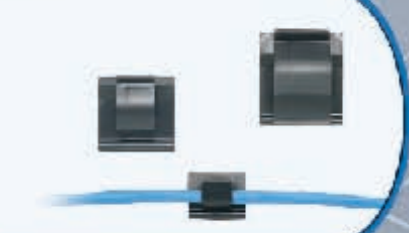
Available in black and white.



High Bond Adhesive Cord Clips:

ACC19-AV-M300
ACC38-AV-M300
ACC62-AV-D300

Provides maximum adhesion in rugged, high-temperature and outdoor environments.



*When the front line delivers to the bottom line
– Trust Panduit.*

Built for Durability

Whether it is a daily wash-down, continual chemical exposure, or close proximity to a blast furnace, certain environments wreak havoc on control systems. Panduit products are built for resiliency and built to last.

For example, Pan-Ty® Cable Ties are offered in a variety of specialty materials:

Polypropylene Cable Ties – Provide superior chemical resistance to acids, bases, and salts making them ideal for chemical plants.

Metal Detectable Cable Ties – Unique metal impregnated material allows identification by metal detectors or x-ray inspection to meet food, beverage and pharmaceutical safety standards by helping to reduce product contamination.

HALAR[^] Cable Ties – Identifiable maroon colored parts UL Listed for use in plenum or air handling spaces per NEC, Section 300-22 (C) and (D).

Flame Retardant Nylon 6.6 Cable Ties – Ties are UL94V-0 rated for applications requiring resistance to flame propagation.

[^] HALAR is a registered trademark of Ausimont USA, Inc.



Thick Wall Adhesive Lined Heat Shrink:
HST1.5-48-5Y

Wet Shrink Applications - insulates a wide range of diameters and irregular shapes which reduces inventory costs.



Corrugated Loom Tubing:
CLTS25N-C

Solid wall nylon heat stabilized. Up to 110°C (230°F) operating temperature.



IP-67 Plugs and Patch Cords:
MPI588T
ISTPCH1MBLY



Polypropylene Cable Ties:
PLT2S-M109
PLT2H-TL109

For chemical resistance especially in the presence of hydrochloric acid, salts and bases.



Push Mount Cable Tie Mounts:
MPM38-D0
(for masonry holes-shown)
PWMS-H25-C0
(for metal panels)
PUM-071-C30
(for varying panel thickness)

Thin Wall TEFLON[^] Heat Shrink Tubing: HSTTT24-48-Q

Dry shrink applications.
Up to 500°F (260°C)
operating temperature.



Thin Wall KYNAR^{*} Heat Shrink Tubing: HSTTK19-48-Q

Dry shrink applications -
clear. Up to 347°F (175°C)
operating temperature.



KYNAR^{*} Insulated Ring Terminals PK Series:

Manufactured from 56%
thicker material stock
than standard terminals.
Also available in high
temperature (up to
650°F (343°C)).



High-Temp PEEK Cable Ties and Mounts: PLT2S-C71 TM2S8-C71

Ideal for use in high temperature
and harsh chemical environments.



Pan-Steel[®] Coated Metal Locking Ties: MLTFC4H-LP316 MLTFC6H-LP316

Strength of steel with the
addition protection of a
polyester coating.



Battery Powered MLT (Metal Locking Tie) Installation Tool: PBTMT

45% faster than
conventional tools.



Pan-Steel[®] Metal Locking Ties: MLT4EH-LP316 MLT4H-LP316 MLT4SH-LP316

AISI 316 stainless steel for the
most corrosive environments.



For Severe Environments

We field questions daily on temperature extremes, life expectancy and caustic environments and design our products to be pushed to the extremes. We have over 3,200 parts that are certified by the American Bureau of Shipping (ABS), which regulates the standards for the harsh environment performance rating required for product use in Military Seagoing vessels and Offshore Oil and Gas. (The ABS has more stringent standards than Military Specifications and Nuclear Certifications.)

Panduit offers both stainless steel and aluminum cable ties, along with laser etched or embossed marker plates and tags that are part of our Pan-Steel[®] System, which is dedicated to meet your most demanding applications:

- Stainless Steel Cable Ties
- Stainless Steel Strapping
- Permanent Identification
- Installation Tools

Our Pan-Ty[®] Cable Ties are available in a variety of specialty materials:

Weather Resistant Nylon 12 Cable Ties - A material with 15 years of weathering life and resistance to zinc chlorides and dilute acids.

High-Temperature PEEK Cable Ties - Provide excellent performance at continuous operating temperatures of up to 500°F (260°C), best in class strength, in addition to chemical and radiation resistance.

Tefzel^{} Cable Ties** - Low smoke density and excellent flammability rating of UL 94V-0. Distinct aqua blue color.

[^] TEFLON is a registered trademark of E.I. du Pont de Nemours and Company.

^{*}KYNAR is a registered trademark of Atofina Chemicals, Inc.

^{**}TEFZEL is a registered trademark of E.I. du Pont de Nemours and Company.

*When the front line delivers to the bottom line
– Trust Panduit.*



**Stainless Steel and Brass
Marker Plates and Tags:**

MMP350-C316
MMP350H-C316
MTB1D-Q316

Can be embossed or laser etched
with custom marking service.



TEFZEL Cable Ties
and Mounts:**

PLT2S-C76
TM3S8-C76

Ideal for applications requiring
resistance to gamma radiation
and chemical attack.



**UL and CSA Listed
Compression Power
Connectors for Code
and Flex Cable:**

Connectors meet NEBS Level 3
performance in extreme
conditions and are approved
by ABS.



**UL and CSA Listed
Compression Power
Connectors for
Metric Cable:**

Temperature rated to 90°C
when crimped with Panduit
tools and dies.



**Heat Shrink Moisture
Resistant Terminals and
Splices:**

PH14-10R-Q
PH14-10F-Q
BSH14-Q

Protects against moisture.



**Nickel Plated High
Temperature Ring
Terminals:**

P14-10RHT6-C

For temperature up
to 600°F (348°C).



Heat Shrink Labels:

Available in a wide variety of
sizes and colors. Meets MIL, UL,
AMS-DTL, and nuclear plant (1E)
requirements.

**TEFZEL is a registered trademark of E.I. du Pont de Nemours and Company.

Representative offering only, visit www.panduit.com for complete listing of products.

IN-Route – Pathways

HALAR[^] Cable Ties:

PLT1M-C702Y

For air handling spaces.



J-Pro[™] Cable Support System:

JP2SBC87R-L20

NEW!

Use with Plenum rated Tak-Ty[®] Cable Ties.



Corrugated Loom Tubing:

CLTS25N-C

Provides cable abrasion protection.



FiberRunner[®] Routing System:

FR4X4YL6

Designed to segregate, route and protect fiber optic and high performance copper cabling.



Fiber Cable:

Wide variety of cable options and flammability ratings.



Copper Cable:

Wide variety of cable options and flammability ratings.



Identification Systems

Marker Plates (bundles)

Component Labels (pathways)



[^] HALAR is a registered trademark of Ausimont USA, Inc.

*For optimal connections
– Trust Panduit.*

Optimize Cable Routing and Management

Walk through any manufacturing facility, glance at the ceiling and you will encounter a variety of cable routing schemes deployed. The two most common are steel conduit and tie wrapping to the building infrastructure – there are alternatives. Panduit offers both *open-style* and *enclosed-style* methods. The open-style uses the J-Pro™ Cable Support System to allow for cable to be routed overhead. The enclosed-style is the FiberRunner® Routing System, which is offered in a variety of sizes to allow for network cabling to be protected. Unlike conduit, the cables inside this system are easily accessible. This allows for a single person to install a new cable without fear of damaging the existing, or requiring a secondary person to help feed cable. Panduit has also pioneered compatibility of FiberRunner® Routing Systems and conduit to form a *hybrid* solution.

IN-Route – Zone Enclosures

NEMA 4X/IP66 Wireless Access Point Enclosure: PZNWE14

Mount popular wireless access points in wet or outdoor locations.



NEMA 4X/IP66 IndustrialNet™ Ethernet Switch Enclosure: IAEIP66

Enclosure for industrial switches suitable for wash down locations.



Active Equipment Wall Mount Enclosure: PZAEWM3

Vertical mounting of up to 3 rack units of active EIA mountable equipment or patching.



Wall Mount Zone Enclosure: PZC12S

Up to 12 rack units of active or passive equipment and patching; optional fan kit available.



Pan-Ty® Cable Ties and Mounts: PLT2S-C ABM2S-A-C TM2S8-C

Panduit provides reliable bundling solutions for virtually any application.



OptiCam® Fiber Termination Kit: FCAMKIT

NEW!



Copper Wire Snipping Tool: CWST

Cable Jacket Stripping Tool: CJAST

Jack Termination Tool: TGJT



*For optimal connections
– Trust Panduit.*

Proper Implementation Starts with Good Design

Following a Zone Topology for a factory network reduces home-run wiring, increases flexibility when performing moves, adds and changes (MACs), and eases network maintenance so that critical network components are easily accessed. At the heart of the Zone Topology methodology are Network Zone Enclosures (NZE), which are dedicated enclosures that contain network switches, slack management devices, and patch panels. They also serve as network transition points; for example from backbone to subnets. Panduit offers three sizes of NZEs and a fourth, made of fiberglass to house a wireless access point. Copper and fiber optic cable complete the network, and are offered in a variety of color and jacket types to complement the chosen industrial pathway.

IN-Room – Micro Data Centers

19" Standard EIA Rack: CMR19X84

Basic mounting frame for equipment, patching and vertical and horizontal cable management.



12" Wide Front and Rear Vertical Manager: NVR12 NRD12 (metal door)

Provides critical cable management for optimal equipment performance.



4 Post Open Equipment Rack: R4P

Heavy duty rack with independent adjustable mounting rails.



2 RU PatchLink™ Horizontal Cable Manager: WMPH2E

Dual hinge covers all cable access without removing cover.



Hinged Wall Mount Bracket: WBH4E

Up to 6 rack unit versions suitable for use in enclosures.



2 RU NetManager™ High Capacity Horizontal Cable Manager: NM2

Designed for high cable densities.



Net-Access™ Switch Cabinet: CN2



Dual hinged front door allows easy access to all components.



Micro Data Centers – Dedicated to Improving Factory Automation

Most likely you have seen them before: desktop PCs stacked on to one another, a tower computer tucked underneath a desk, or perhaps even a server mounted to some plywood on a control room wall. It is time to rethink your network, compute and storage needs and the best place to start is with a *Micro Data Center* from Panduit.

Your computer and storage demands continue to grow for programming, visualization, process monitoring, quality control, asset management and maintenance. So wouldn't you be better served with a Micro Data Center to host and protect these soft assets?

A Micro Data Center footprint is small, so your job of finding the best location is made easier. Panduit's job is keeping it structured and well organized for today's needs and tomorrow's opportunities.

Making a Direct Impact on High Availability

Panduit has products that facilitate high availability architecture, ensure reliable connectivity, improve meantime between failure, and minimize risk.

- Pre-terminated fiber and copper, e.g. QuickNet™
- Identification products, e.g. Turn-Tell®, color bands, flag ties labels
- Network monitoring, e.g. PIM™ and PVIQ™ solutions
- Port connectivity, e.g. Lock-in devices
- Color-coding, e.g. jacks and patch cords

DEFINITION:

A Micro Data Center is a partial, single, dual or triple rack/cabinet that house the servers, switches, patch panels, horizontal/vertical cable management, accessories and DIN mounted devices that are dedicated to the manufacturing zone. It could also contain the devices that create the Demilitarized Zone (DMZ).

*When everything inside is mission critical
– Trust Panduit.*



Telecommunications Grounding Busbars (TGB):
GB2B0306TPI-1

Meets BICSI/J-STD-607-A standard.



Auxiliary Cable Bracket and Jumpers:

GACB-1
GACBJ68U
GACBJ612U
GACBJ618U



Telecommunications Equipment Bonding Conductor (TEBC) Kits:
GJ6144UH

Bonds the rack or cabinet to the TGB.



Fiber Enclosure Components:

FCE1U
(Rack Mount Fiber Enclosure)
FAP12WBLDLC
(Fiber Adapter Panel)
F5E10-10M1Y
(Fiber Patch Cord)



Power Outlet Unit (POU):
PV12LN*

30 AMP, 240V, 12 receptacles.

*For use with Net-Access™ Cabinet.



Power over Ethernet Systems (DPoE™):
DPOE8KIT

Scalable kit includes 8-port midspan, power supply and power cord.



Data Center Tool Kit:
DCTK-CK

Designed to meet the specific mechanical and electrical tooling needs of the data center installer.



**Jack
Blockout Device:**
PSL-DCJB

**LC Fiber Duplex Adapter
Blockout Device:**
PSL-LCAB

Fiber optic version not shown.

Plug Lock-In Device:
PSL-DCPL
PSL-DCPLR

**LC Lock-In Fiber
Duplex Clip:**
FLCC4W-X

Fiber optic version not shown.

Keyed Fiber Patch Cord:
FXE10D-10DM*

**Keyed Fiber
Connector:**
CMDYLLCZ1W

18 colors available.

**Keyed
Jack Module:**
CJK688TGBU

Keyed Patch Cord:
UTPKSP3BU

Available in Category 6A, 6 and 5e options for UTP and shielded installations.

Leave Nothing to Chance

Locks- Panduit has the right products to physically secure network systems, including:

- Lock-In Devices
- Blockout Devices
- Keyed Jack/Plugs
- Locked Cabinets

Comprehensive Identification - Identification in a Micro Data Center aids installation, maintenance, and troubleshooting. Field wiring back to the Micro Data Center may include designation for a zone box, enclosure, machine port or test devices.

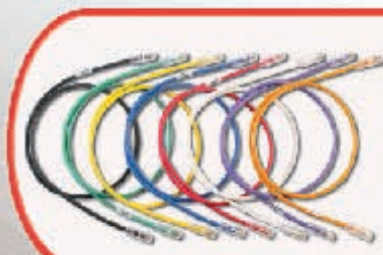
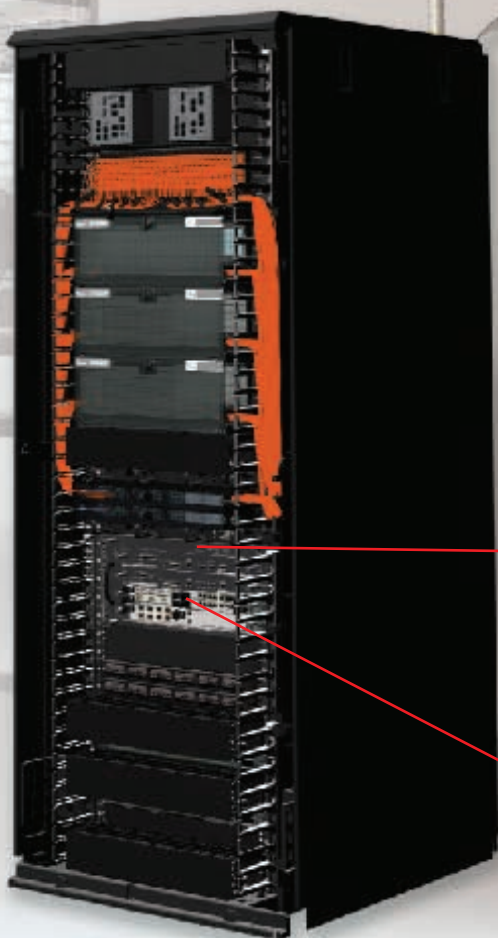
Color-Coding - Panduit has a full range of color-coded cables, jacks, patchcords, and bands. Possible color-coding applications include:

- Redundant Network “A” and “B” path
- VLAN
- Equipment grouping
- Process/production line grouping
- Building location
- Enterprise, DMZ and Manufacturing zones

Physical network security design follows the Defense in Depth (DiD) methodology that promotes layers of security. Physical network security implementation starts with the Physical Infrastructure.

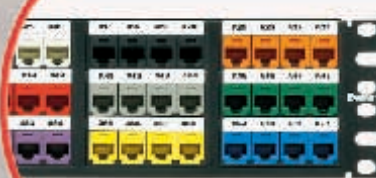


*When everything inside is mission critical
– Trust Panduit.*



Color-Coded Cable

Provides maximum design flexibility



Color-Coded Jacks

Can be clearly identified with optional label and icons.



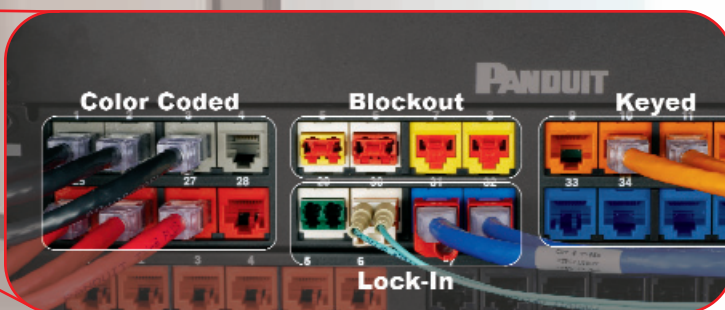
Color-Coded Tak-Ty® Cable Ties

Safe to use on high performance cabling and protects against over-tensioning.

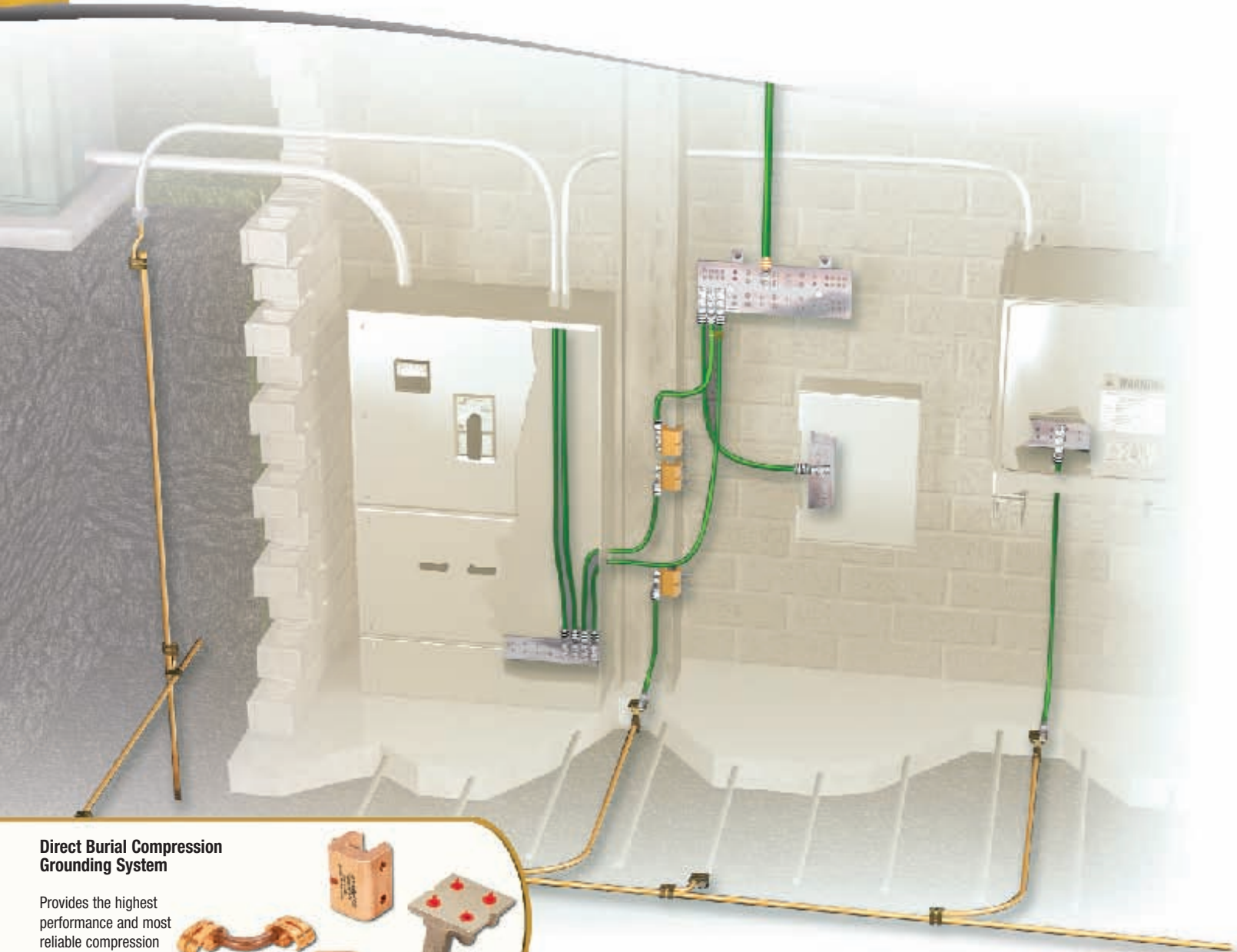


Patch Cord Color Bands: PCBAND**-Q

Available in 10 standard colors, removable and reusable.



IN-Frastructure – Power and Grounding



Direct Burial Compression Grounding System

Provides the highest performance and most reliable compression connection in the industry.



Mechanical Grounding Connectors

Designed for easy installation – no special tools required.



Underground Detectable Hazard Tape:

HTDU

Used to warn of buried utility lines.



Reliability and Performance from the Ground Up

StructuredGround™ Direct Burial Grounding System offers the speed and safety of a compression connection while meeting the newly revised IEEE Std. 837™ -2002, delivering safety and reliability. IEEE Std. 837™ -2002 is now an even tougher test of corrosion resistance than IEEE Std. 837™ -1989. Connectors that meet the 2002 revision of IEEE Std. 837™ reduce the risk by providing a more robust barrier against the corrosive elements that could otherwise cause the grounding system to fail.



*To protect your capital assets
– Trust Panduit.*



Proven Reliability for Mission Critical Applications

Panduit provides solutions for all of the critical connections from the utility transformer through the network equipment to protect your data center investment. Panduit copper compression lugs and splices are UL Listed, CSA Certified, and are the first and only connectors to meet Network Equipment-Building Systems (NEBS) Level 3 Requirements as tested by Telcordia Technologies. (NEBS Level 3 is a set of stringent tests that subject components to extreme environmental conditions.) Connectors that meet these requirements help ensure dependable performance over the life of the installation.



**UL and CSA Listed
Copper Compression
Lugs for Code, Flex
and Metric Conductors**



**Lithium-Ion Battery
Powered Crimping Tools**

Provide up to 135% more crimps per charge and up to 30% faster cycle time.



**Semi-Rigid Adhesive
Lined Heat Shrink
Tubing:**

HSTTRA50-48-5

Damp shrink applications.

IN-Frastructure – Lockout/Tagout and Safety

Pneumatic Energy Lockout Device:

PSL-PEL

Quickly locks out pneumatic energy device without costly tool modifications or inconvenient in-line valves.



Circuit Breaker Lockout Device:

PSL-CB
PSL-CBIL
PSL-CBNT
PSL-CBILNT



Multiple Lockout Device:

PSL-MLD

Only one device needed to perform a variety of lockout functions.



Gate Valve Lockout Device:

PSL-V2A
PSL-V9
PSL-V13

Prevents valve handle from being turned.



Ball Valve Lockout Device:

PSL-BV1
PSL-BV2
PSL-BV3

Prevents valve handle from being turned.



Comprehensive Safety Solutions

The control of hazardous energy, 1910.147 is the OSHA standard for Lockout /Tagout. The fundamental goal for this standard is to control the release of hazardous energy during maintenance and servicing. All of the following energy types have the potential to cause personnel fatalities/injury and/or environmental and capital equipment damage/destruction.

- Mechanical
- Hydraulic
- Electrical
- Gas
- Pneumatic
- Water
- Chemical
- Thermal

Safety is no accident! Panduit not only provides comprehensive Lockout/Tagout products and signage, but we also deliver on the necessary training materials to help your entire enterprise. Panduit safety products lockout a full range of energy sources. We also have a complementary array of warning tapes that illuminate affected areas.

*To protect your capital assets
– Trust Panduit.*



**Toggle Switch
Lockout Device:**
PSL-WS

Locks out electrical supply
controlled by ordinary
toggle switches.



Electrician Lockout Kit:
PSL-PK-EA

Kit contains a variety of
lockout/tagout devices commonly
used by an individual electrician.

UPDATED



NEW!

Lockout Stations:
PSL-4SWCA
PSL-10SWCA
PSL-20SWCA

Conveniently store padlocks,
tags and lockout devices in
one common area.



Plug Lockout Device:
PSL-P

Locks a wide range of individual
plugs to prevent energization.



NEW!

Lockout Padlocks:
PSL-6
PSL-7
PSL-8 (shown)

Each lock keyed differently
and supplied with 2 keys.

IN-Frastructure – Identification Labeling

Inform, Direct and Warn

Signage is used in multiple locations throughout a facility. It forms the backbone for life safety information such as exit signs, arc flash potential, high voltage and sheltered areas. It also helps with routine tasks that mark, for example, the location for parking a fork lift truck.

Panduit is continually developing quicker ways to deploy signage through innovative printers which work with our Easy-Mark™ Software. We look for ways to allow greater customization of signage that fits your exact needs. Finally, we continue to expand the types of signs from pre-printed to raised labels.

Easy-Mark™ Labeling Software

WYSIWYG (What You See Is What You Get) Design Interface

Import data from Excel

Import symbols from library or custom images (.jpg, .bmp, .wmf, .gif)

Simple to use text and serialization

All Panduit label formats pre-loaded

Includes Application Specific Wizards

Easy-Mark™ To Go Labeling Software

All the features of Easy-Mark™ Software are on a USB Flash Drive, eliminating the need to install a dedicated copy of labeling software on each labeling computer.

CAD-Connect™ Software

Extract label identifiers from AutoCAD and Visio automatically
Bolt-on installation to Easy-Mark™ Software

Arc Flash and Safety Labels :

PVS0305W2201Y

PVS0305W2102Y

Pre-printed and blank labels.



Continuous Tapes:

T400X000VU1Y

T400X000VX1Y

T200X000VU1Y

T200X000VX1Y



Desktop Printers and Software

Safety Signs:

PVS Series (vinyl)

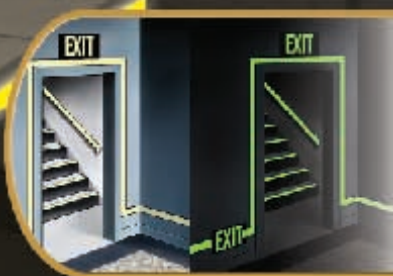
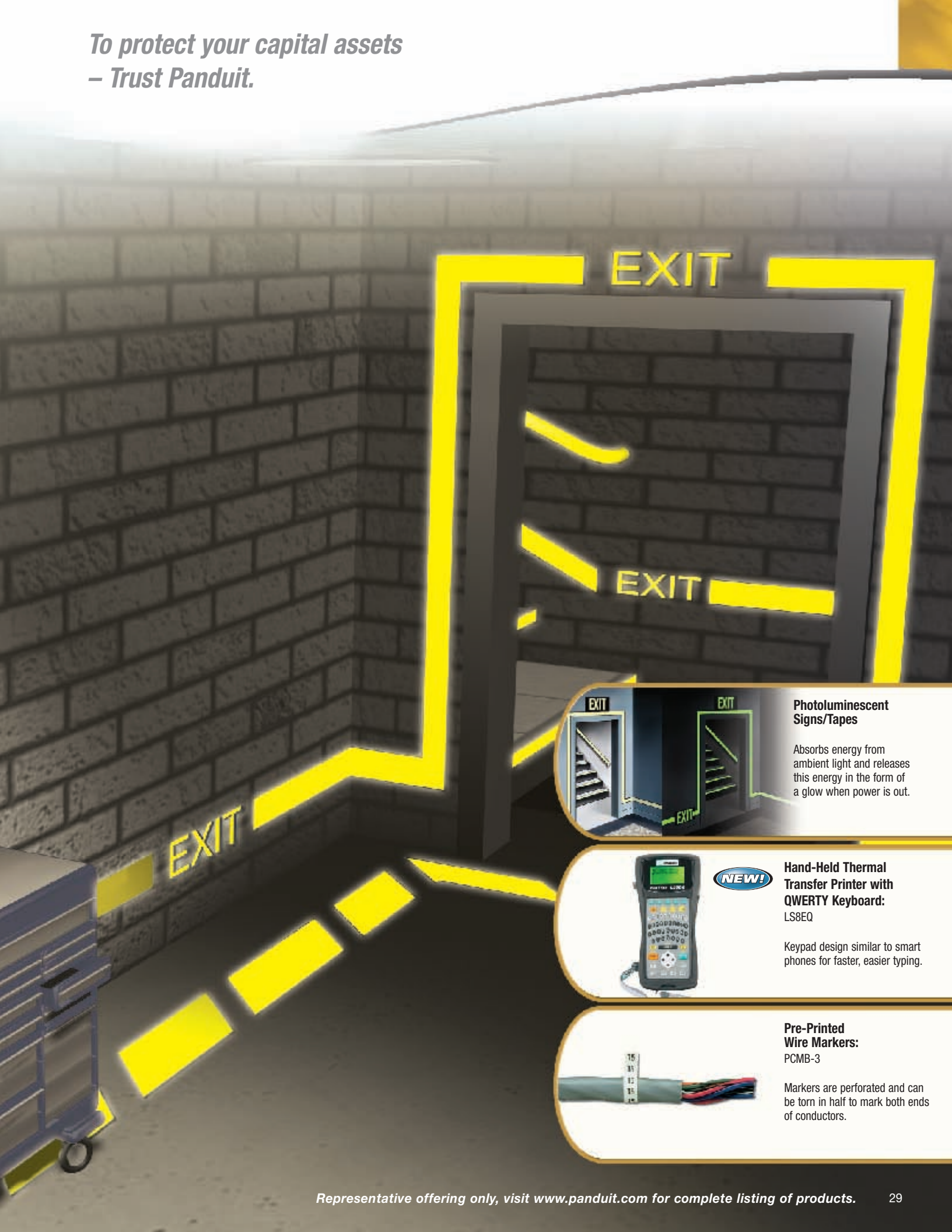
PPS Series (polyester)

PRS Series (rigid)

High quality signs for use indoors and outdoors.



*To protect your capital assets
– Trust Panduit.*



**Photoluminescent
Signs/Tapes**

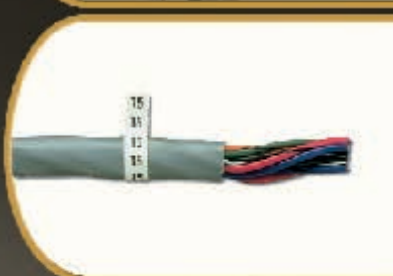
Absorbs energy from
ambient light and releases
this energy in the form of
a glow when power is out.



NEW!

**Hand-Held Thermal
Transfer Printer with
QWERTY Keyboard:
LS8EQ**

Keypad design similar to smart
phones for faster, easier typing.



**Pre-Printed
Wire Markers:
PCMB-3**

Markers are perforated and can
be torn in half to mark both ends
of conductors.

Resources and Beyond

ReelSmart™ Ferrule Applicator:

CA10

For use with all continuously molded ferrules with less than one minute crimp die changeover. Universal base works in many industry presses.



CA9 Ezair™ Applicator:

CA9

Terminates all continuously molded terminals and uses quick-change dies for fast product changeover.



Electric Bench Press:

CP-871

Microprocessor controlled automated press for use with Panduit® Universal applicators and ReelSmart™ Terminals and Ferrules. 4000+ terminations/hour.

Separate reel
of terminals.



Automatic Cable Tie System:

PAT1M (Hand Tool)
PDM (Tie Dispenser)
PHM3 (Hose)

Up to six times faster than
conventional manual systems.

Separate reel
of cable ties.



Robotic Kit:

PATM-RK

Optional Kit utilizes electronic
interface option (PDM-EI) to
integrate the PAT System
to a robot.



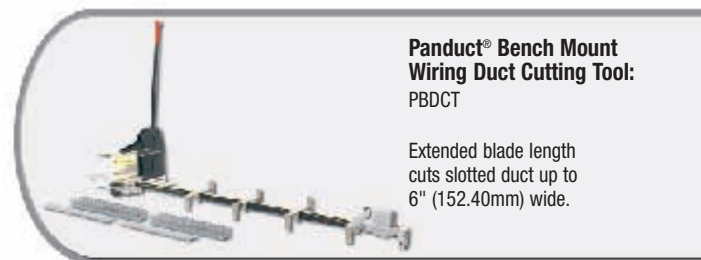
*If being on the cutting edge pushes you to the limit
– Trust Panduit.*

For Automating Operations and Speeding Design

Panduit's specialty products drive productivity and agility during the project design and operation phase.

Factory Floor - If you need to migrate from manual, semi-automated, or fully automated, Panduit has the dynamic tools that speed assembly without sacrificing quality. Our CP-871 electric press can make 4,000+ ferrule terminations per hour! Whether it is mounted on a machine or attached to the end of a robot's armature, our tools offer superior integration and interchangeability to reduce switchover costs and increase machine uptime.

Shop Floor - Panduit's rugged high speed industrial thermal transfer printer creates crisp, clear legends with superior legibility. The saying measure twice and cut once might be true, but making that cut count is easier with a telescoping measure on Panduct® Bench Mount Wiring Duct Cutting Tool.



**Panduct® Bench Mount
Wiring Duct Cutting Tool:**
PBDCT

Extended blade length
cuts slotted duct up to
6" (152.40mm) wide.



**Portable Embossing
System:**
PES197
MMP350H-M316

Works with the Panduit®
Easy-Mark™ Software to make
a wide variety of ID tags.



Fast Bench Crimping:
CT-930LPCH

Real-World Solutions to Ensure the Success of Our Customers

With a proven reputation for excellence and technology innovation, a robust ecosystem of global partners, and long-term alliances with top industry leaders, Panduit is a valuable, trusted partner offering strategic vision and real-world solutions to ensure the success of our customers.



Innovative Technology Leadership

Panduit is an industry leader in developing innovative technology solutions that meet the rapidly evolving needs of our customers around the world. Our commitment to continued leadership is supported by significant ongoing investment, dedicated manufacturing facilities, strategic technology alliances, and collaborative R&D with other industry leaders.



Global Business & Commitment

Panduit's ongoing commitment to excellence and our technology alliances with key industry leaders such as Cisco Systems, EMC, Emerson, IBM, etc., enables our highly skilled and knowledgeable global sales, systems engineering, and technical support teams to engage with critical customer challenges that range from initial problem determination all the way to resolution. Local specialists, trained to global standards and competencies, provide consistent regional support that brings value to local business. Our global value chain, which combines manufacturing, distribution, and service, provides prompt responses to customer-related issues, and streamlines procurement and delivery to any global destination.



Best-in-Class Partner Ecosystem

Panduit employs a consultative approach to identify customer needs and engage appropriate partners in a collaborative fashion to serve our customers. Panduit's robust ecosystem of architects, consultants, engineers, designers, systems integrators, contractors, and distributors offer a full portfolio of lifecycle services. Our partners are trained on relevant services to Plan & Design, Build & Deploy, and Maintain & Operate to deliver predictable and measurable results.



Worldwide Alliances

Panduit has established long-term strategic alliances with top global industry leaders such as Cisco Systems, EMC, HP, IBM, Liebert, and Rockwell Automation to develop and integrate innovative, holistic solutions for our customers. We continually invest in relationships and resources for solving our customers' greatest business challenges.



Eco-Sustainability & Global Citizenship

With a long-standing commitment to environmental excellence, Panduit continually develops and implements solutions designed to protect, replenish, and restore the world in which we live and operate. This commitment is demonstrated by Panduit's LEED-certified new world headquarters and future green building plans using its own revolutionary Unified Physical InfrastructureSM vision to enable convergence of critical systems for driving sustainability.

**Transform Your
Physical Infrastructure
from Panel to Plant.
Call or visit us online,
we can show you how.**

**Panduit Corp.
World Headquarters
Tinley Park, IL 60487**

**cs@panduit.com
US and Canada: 800.777.3300
Europe, Middle East, and Africa:
44.208.601.7200
Latin America: 52.33.3777.6000
Asia Pacific: 65.6305.7575**

www.panduit.com/IA

PANDUIT®