# Physical Infrastructure Foundation

**PANDUIT**®

building a smarter,
unified business foundation

Connect. Manage. Automate.

## Panduit's Unified Physical Infrastructure (UPI):

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.

**Mitigate Risk –** Efficient physical infrastructure management enables seamless integration to reduce risks that can occur throughout core systems.

**Lower Cost –** Panduit physical infrastructure solutions drive financial advantages to reduce energy and occupancy costs, and help secure competitive advantage.

**Increase Agility –** A high level of integration within the physical infrastructure enables flexibility and improved business agility.

**Enhance Sustainability –** UPI-based solution offerings enable organizations to meet sustainability goals by driving resource and energy efficiencies across the physical infrastructure.

### Unified Physical Infrastructure

communication    computing    control    power    security

# Providing a Complete Data Center Infrastructure Solution

As you plan and design your data center, you have the opportunity to include important infrastructure elements such as cable pathways, grounding and bonding, and identification, that if not adopted could have a significant impact on the operational efficiency and network reliability of your data center. As a data center manager, your primary objective is to dedicate the appropriate time to manage your budget, SLA's, and staff. Managing ongoing operational and reliability issues affects your ability to meet those objectives.
What if you could have:

- Simplified design specification
- Faster implementation
- Operational efficiency
- Visibility and control
- Industry best practices

Reference architectures are elevating enterprises to new heights of agility, flexibility and efficiency in IT manageability; success in achieving these benefits relies on critical physical infrastructure foundation considerations. Not only must the physical infrastructure be able to support the requirements of the data center, it must perfectly align to the logical network design.

**We understand your challenges.**

Panduit draws upon a deep expertise in providing world-class data center solutions and designs based on industry best practices, offering you a combination of services, software, and products that results in optimized physical infrastructures. This allows you to focus on being more responsive, improve operational efficiency, and increase your organization's strategic relevance to the business, ensuring reliability, agility, and security to drive business advantages and overall success.

# Innovative Data Center Infrastructure Solutions

Panduit delivers comprehensive solutions that optimize the reliability, availability, security, integration, and safety of the physical infrastructure. Through robust, innovative systems designed for intelligent deployment and convergence, Panduit solutions help mitigate risk factors across IT, facilities, operations, and manufacturing to achieve business efficiencies with lower total cost of ownership.

Panduit provides an extensive, intelligent data center offering that supports best practice methodologies. Our data center solutions enable physical to logical architecture integration, and deliver robust, scalable physical infrastructures that address:

- Visibility and control for managing and automating real-time data processes and documentation
- Convergence of new technologies and high-speed data applications
- Operational efficiency through process improvement and IT initiatives, such as cooling conservation through energy efficient data cabinets
- Capacity management for greater real estate utilization
- Modular pods designed to support high-density applications and provide consistent, reliable deployments while lowering infrastructure risk and costs
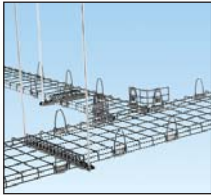
Panduit's intelligent data center solutions facilitate faster implementation and simple specification, streamlining the process of designing, specifying, installing, and managing the increasingly complex physical infrastructure necessary to optimize your data center.

**Panduit knows the data center space intimately.**

Attention to detail is critical for streamlining data center operations. It can mean the difference of a six hour outage, or finding the problem before it occurs. Proper grounding and bonding, identification, zone cabling, and cable bundling are tangible physical infrastructure improvements that increase functionality, interoperability, and manageability of mission-critical operations across your entire organization.

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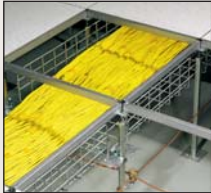# A Complete Physical Infrastructure Foundation

**1** Wyr-Grid® Overhead Cable Tray System

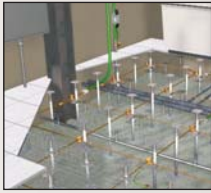**2** FiberRunner™ Cable Routing System

**3** GridRunner™ Underfloor Cable Routing System

**4** Network Grounding and Bonding System
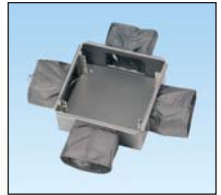
**5** StructuredGround™ Grounding System

**6** Identification and Labeling System
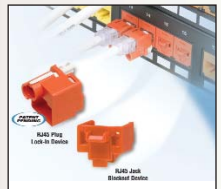
**7** PanZone® Raised Floor Enclosure



**8** PanZone® Overhead Distribution Racks



**9** Three Digit Combination Lock



**10** RJ45 Jack Block-Out and RJ45 Plug Lock-In Devices



**11** LC Fiber Optic Block-Out and Lock-In Devices
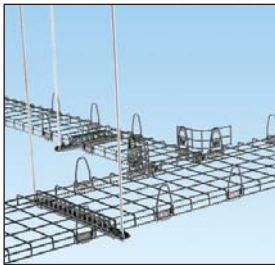


**12** Tak-Ty® Hook & Loop Cable Ties



**13** Patch Cord Color Bands



**PANDUIT®**

# Physical Infrastructure Foundation Elements

**Critical to the deployment of Intelligent Data Center Solutions is the physical infrastructure foundation within the data center, which includes:**

## Pathways

Wyr-Grid® Overhead Cable Routing System is designed to route and manage copper, fiber, and power cabling overhead within data center, connected building and industrial automation applications. **Innovative features provide fast, easy assembly that reduces installation time by up to 74% resulting in lower installation costs and faster network implementations*.** The system is engineered to seamlessly integrate with FiberRunner® Pathways, Panduit Racks, and Cabinets to provide a complete physical infrastructure foundation.

FiberRunner® Cable Routing System is designed to route, manage and protect fiber optic and high performance copper cabling above network racks and cabinets within data centers and service provider facilities; engineered to support maximum cable capacities over the life of the deployment. **Innovative features provide quick, easy assembly for faster deployment, reduced cost and up to 50% reduction in installation time*.**

GridRunner™ Underfloor Cable Routing System provides an end-to-end solution for the physical layer infrastructure. The GridRunner™ Underfloor Cable Routing System is a high capacity, versatile, underfloor cable pathway. **It is designed to route and manage copper cables, fiber optic trunk cables, and power cables beneath a raised floor system within data centers; reducing installation time by 20 to 50%*.**

## Grounding and Bonding

The network grounding and bonding system is more than just an insurance policy against a lightning strike. It is an active, functioning system that mitigates risk throughout the enterprise by providing crucial protection to equipment and personnel. Proper grounding is essential for efficient network system performance. Improper grounding can result in failures such as lower data transmission rates, unacceptable downtime, damaging expensive equipment and voiding equipment warranties.
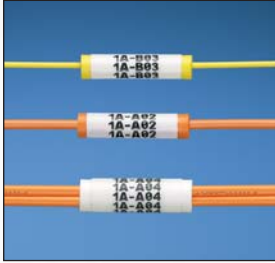
Panduit offers end-to-end solutions to meet customer needs and today's critical application requirements for grounding data centers. Panduit® StructuredGround™ Grounding System provides a high quality, visually verifiable, and dedicated grounding path to maintain system uptime, improve network reliability, and protect network equipment and personnel. Highest reliability is ensured; this grounding system meets all applicable grounding and bonding industry standards. **Panduit® StructuredGround™ Grounding System gives you what you need to properly protect your investment. Savings from reduced down time is estimated at $84 per cabinet per year*.**
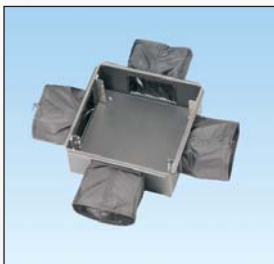
## Identification and Labeling

Proper labeling enhances the appearance of installations by presenting a clear and effective means of identification. An appropriately labeled data center will reduce mean time to repair (MTTR), allowing you to locate, troubleshoot, and address network issues more effectively.

Panduit designs and manufactures a full line of labeling products, software, and printers to assist with your identification efforts. Properly identifying your data center allows moves, adds, changes (MAC's) to be accomplished more efficiently, lowering the cost of ownership.

## Zone Cabling

Zone Cabling serves as a main distribution point for a particular area within the data center, increasing network agility, manageability, accessibility, and efficiency. Panduit zone cabling products can be used in floor and overhead providing a complete end-to-end network solution. With zone cabling topology in place, data center managers provide themselves with a scalable physical network infrastructure that meets their needs today as well as the flexibility to deploy the technology of tomorrow.

PanZone® Overhead Distribution Racks are the ideal solution for adding more rack space above racks or cabinets in data centers. The universal mounting bracket can be mounted to Panduit® Wyr-Grid® or most industry ladder racks, wire basket, or suspended by threaded rod from ceiling.

Panduit® PanZone® Raised Floor Enclosure saves valuable real estate by providing space below the raised floor to mount TIA 19" flat rack mountable patch panels, which relieves congestion in racks and cabinets for installing network equipment. For mainframes or storage area network applications, valuable floor space can be saved by locating a termination point in a raised floor enclosure rather than in an adjacent cabinet.

The Cool Boot® Raised Floor Air Sealing Grommet reduces bypass airflow up to 50 CFM per raised floor opening and prevents debris from falling below the raised floor. **In a data center with 330 raised floor cutouts, conserving 50 CFM per opening is equivalent to the capacity of one 30-ton CRAH unit*.**

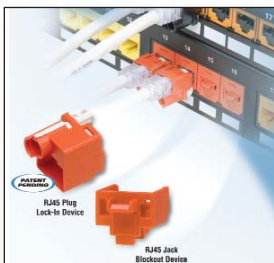**PANDUIT®**

# Physical Security

The network infrastructure provides the applications, support, services, and security necessary to enable agility throughout the organization. It is critical that network security and protection guard against unauthorized access to reduce downtime, prevent vandalism or abuse to system components, and help ensure lowest cost of ownership.

**Physical security products reduce risk throughout the physical infrastructure and help organizations maintain secure control of both sensitive and confidential information and help prevent security breaches and network downtime that can cost organizations between $30M – $200M**.**

CCL is a 3 digit combination lock that can be installed on any Panduit cabinet door: Net-Access™ or Net-SERV®, dual hinge, single hinge, or split doors. This combination lock easily replaces our standard door handles. The 3 digit combination easily changes from the factory setting to a custom code. The lock also includes an integrated keyed override that is Master-keyable.

Keyed Fiber Optic and Copper Systems incorporate positive/negative keying features and color-coding for effective physical layer security; keyed and color-coded connectors prevent unauthorized moves or changes in patch fields and at workstations.

RJ45 jack block-out and RJ45 plug lock-in devices provide simple methods to secure connections, control access to data, and deter vandalism to jacks and plugs-saving time and money associated with downtime, data security breaches, hardware replacement and infrastructure repair.

LC Fiber Optic Duplex Adapter Block-Out Device is a tamper-resistant design which blocks unauthorized access to LC duplex ports. The LC Fiber Optic Lock-In Duplex Clip prevents unauthorized removal of cable and secures connections. The products work to reduce network downtime, data security breaches, and hardware replacement due to theft.

In the data center, Panduit creates innovative solutions that improve security for both data and equipment within the physical infrastructure, ensuring that only authorized individuals have access to network devices.
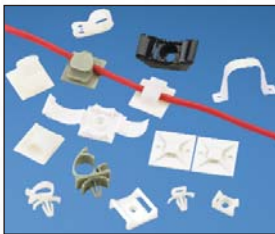
# Cable Management Accessories

Panduit offers a full line of cable ties and cable management accessories to bundle, route, and identify cable in a variety of applications. With the most complete selection of cable tie and accessory products, Panduit provides innovative solutions to meet various application environments, customer needs, and industry standards.

Panduit cable ties are the safe choice for networking applications where performance integrity is critical; designs include a comprehensive line of hook and loop solutions, elastomeric cable ties, UL Listed solutions for plenum use, parallel-entry nylon ties designed to protect cable, and a variety of materials designed for flexibility and strength.

Tak-Ty® Hook & Loop Cable Ties are available in various styles and designed for applications requiring cable safety and frequent moves, adds, and changes; Tak-Ty® Stacked Strip Cable Ties are available in convenient discrete length packaging to eliminate cutting ties to length.

Panduit offers a comprehensive line of mounts, clips, and clamps that organize and route cables, speed and simplify installations, and lower overall installed cost; installation methods include adhesive backed, screw applied, and push barb.

Panduit Cable Bundle Organizing Tool arranges up to 24 data cables optimizing bundle size and improving installed appearance. **This tool reduces cable installation time up to 50%*.**

Patch cord color bands offer color coding for network cables. Removable bands snap on and off individual cables allowing the same patch cord to be used for different applications.

Panduit's Physical Infrastructure Foundation is a critical part of Panduit's Intelligent Data Center Solutions, which embody the next wave of systems integration and risk management by aligning and harmonizing critical systems to support the delivery of secure, energy-efficient, always-on, real-time data and services.

**\*Note: These numbers are dependent upon various conditions. Speak to a Panduit representative for details.**
**\*\*Source: Cost of downtime study by Infonetics for large NA enterprises.**

# Real-World Solutions

*With a proven reputation for excellence and innovation, Panduit and our partners work with you to overcome challenges and implement real-world solutions that create a competitive business advantage. Panduit offers the broadest range of solutions, from data centers and intelligent buildings to manufacturing operations, to help you build a **smarter, unified business foundation.***

## Technology Leadership

Panduit develops innovative physical infrastructure solutions that meet the rapidly changing needs of our clients, from hardware and software to advisory services. This commitment is supported by investment in advanced research, solutions-focused product development, world-class manufacturing, and collaboration with customers at the forefront of technology.

## Partner Ecosystem

Our best-in-class partner ecosystem offers a comprehensive portfolio of services that span the project lifecycle, from planning and design to delivery, deployment, maintenance, and operation. Panduit business partners – distributors, and certified architects, consultants, engineers, designers, system integrators, and contractors – are qualified to help you achieve your objectives and realize predictable and measurable results.

## Strategic Alliances

Panduit cultivates long-term strategic alliances with industry leaders, including Cisco Systems, EMC, IBM, and Rockwell Automation, to develop, optimize, and validate solutions for our customers. This investment in people and resources helps solve our customers' greatest business challenges.

## Global Business Commitment

Panduit is committed to delivering a consistently high level of quality and service the world over. With a presence in more than 100 countries, local Panduit sales representatives and technical specialists offer guidance and support that bring value to your business. Our global supply chain, which includes manufacturing, customer service, logistics, and distribution partners, provides prompt response to your inquiries and streamlines delivery to any worldwide destination.

## Sustainability

With a commitment to environmental sustainability, Panduit develops and implements solutions that protect, replenish, and restore the world in which we live. This commitment is demonstrated by Panduit's LEED Gold certified World Headquarters, leveraging the Unified Physical Infrastructure℠ approach to enable convergence of critical building systems to drive energy efficiency and ongoing operational improvement.

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