

# Data Center Solutions Guide





## contents

### [why Hubbell?]

Drawing on over a century of commitment to innovation and quality, Hubbell Premise Wiring has enhanced product lines and services that provide reliable solutions for data centers. As an industry leader, Hubbell is dedicated to developing and delivering products that improve performance, safety and functionality.

Supporting customers is a top priority at Hubbell. The Hubbell team includes nationwide specification managers, direct field sales and network integrators. Our full line catalog details product specifications and provides application guides on specific topics. Current product information is always available at [www.hubbell-premise.com](http://www.hubbell-premise.com).



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# About Hubbell

## the Hubbell reputation for performance



Hubbell's presence in the data center continues to grow with our evolving product solutions. Large data centers rely on quality Hubbell products and end-to-end solutions that are designed to exceed expectations. We respect the confidentiality of our customers and pride ourselves in delivering effective solutions to government, corporate, financial, healthcare and educational institutions.

Meeting the demands of data center design and construction, Hubbell's breadth of product is an integral part of the communications, power, electrical and grounding infrastructure. From small equipment rooms to large Tier 4 data centers, Hubbell continues to deliver custom high performance cable assemblies and connectivity to meet demanding schedules for deployment and commissioning.

## the Hubbell Premise Wiring networking expertise



Hubbell Premise Wiring is a division of Hubbell Incorporated, a U.S. headquartered manufacturer with over 128 years of supplying quality connections. Hubbell's strength is demonstrated by a long-standing reputation for supplying reliable communications and electrical products. The ability to supply complete end-to-end infrastructure solutions defines Hubbell Premise Wiring as a key manufacturer in the data center space.

Product solutions and services presented in this brochure highlight the capabilities that Hubbell Premise Wiring offers to our community of architects, consultants, engineers and specifiers. Our customer-driven solutions begin with defining the end-user's needs. Our philosophy of employing customer input and Kaizen principles is behind all of our engineered solutions. Hubbell Premise Wiring is an organization dedicated to serving the needs of our clients.

Our highly trained sales force and distribution network have earned global recognition in the structured cabling industry. With offices in 16 countries and a worldwide distribution network, Hubbell makes customer satisfaction our highest priority.

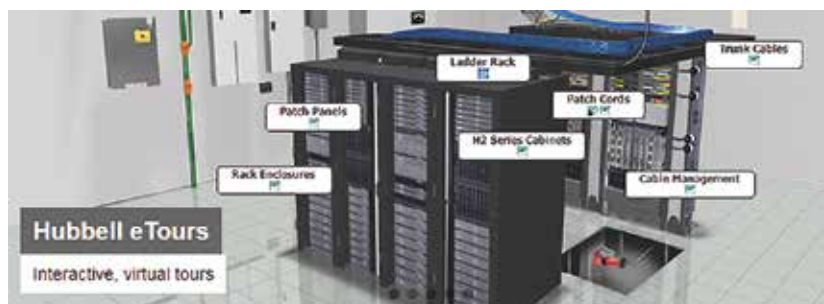




our commitment begins at the earliest stages of planning



- Specification managers and sales engineers are positioned throughout the country for training and standards update assistance.
- White papers and CSI specifications are available for download on our website.
- Application guides explain many of the data center related topics.
- eTours offer a broad view of how all the products work together in different settings.
- An extensive network of certified Hubbell Mission Critical® installers can be found in your local area to provide quality work.
- eTour application guides are available.



# Design IT

## specifying | online resources for designing your data center



- Hundreds of BIM models available to assist with data center design
- Cabling infrastructure products
- Cable management
- Power
- Grounding
- BIM models
- CAD drawings
- CSI specification text

## take off support | let Hubbell compile the bill of material



Working with schematics and blueprints can be a very time-consuming and costly part of doing business. Many contractors employ full-time staff to count components when planning jobs and providing estimates. This task can be handled much more efficiently using Hubbell Premise Wiring's take off services.

Hubbell Take Off Support provides the contractor, engineer, end user a completed BOM, including all related products, counts, symbol legends and information required to price a project. Don't spend the many hours required to do counts and create BOMs for projects, rely on Hubbell's take off services to do it for you.



## [cabinets]

The foundation to all data centers are the cabinets that house and secure active equipment. Hubbell's H2 cabinet series are highly engineered for the most demanding data center installations.

Cable management provisions and accessory products are easily integrated to efficiently manage heavy cable volumes. Cable routing products can be easily installed after cabling the cabinet.

The H2 cabinet series feature removable doors and sides, greater depths to handle the deepest servers and also many sizes that are Z4 seismic certified.

**seismic  
certified**

**capacity  
flexibility**

**leveling  
feet**



## [heat containment]

Contain the heat generated by active equipment by installing a telescoping chimney to direct the heat back to the HVAC system for cooling. H2 chimneys come

in widths for installation on H2S server and H2N network cabinets and telescope up to 66 inches in height.

## [racks]

Relay racks support the equipment and complex distributed cabling infrastructure.

Hubbell products fit the unique challenges of everyday installation. Our product offering includes standard and deep relay racks, extra deep relay racks with integrated cable management, four-post server frames, and the iFrame column system that integrates a relay rack with cable management.

The universal hole mount pattern featured on the sides of the relay racks, server frames allow for easy mounting of vertical cable managers.

**rack unit  
numbering**

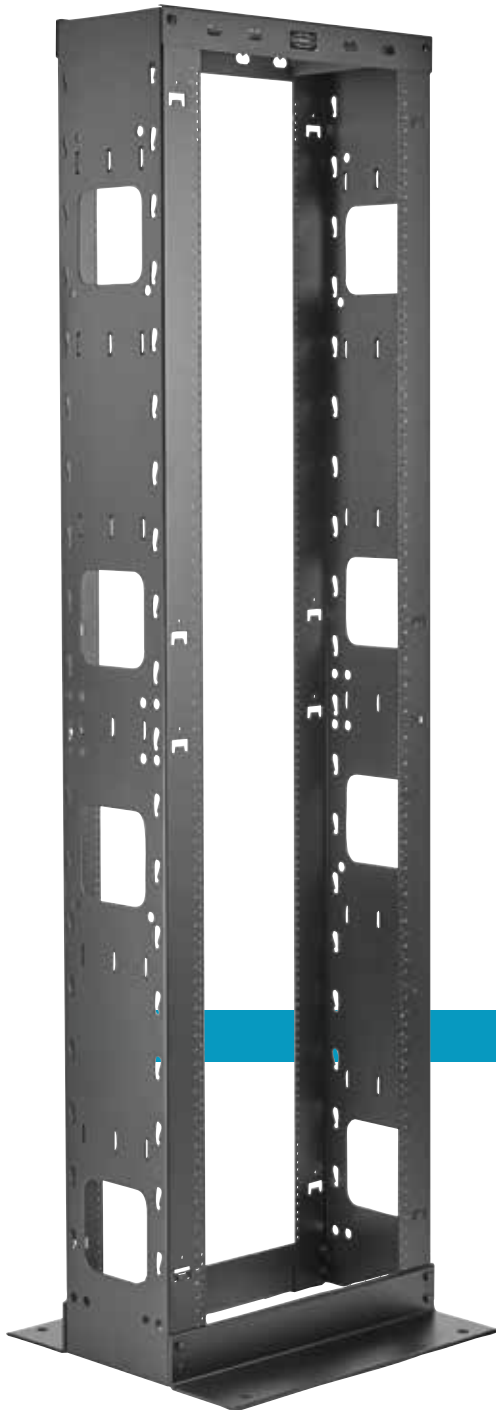
**high load  
capacity**

**space saving**

## [shelves and accessories]

Many options for shelving and server brackets can be found in the full line Hubbell Premise Wiring catalog.

Additional devices for bonding metal components can be found in the Grounding and Bonding brochure or catalog.





# Run IT

## [ladder tray]

Hubbell's high quality ladder tray featuring fully welded steel construction can support heavy loads of distributed cabling. Installation accessories and mounting kits provide many solutions to any application challenge.

Ladder tray has a major benefit due to the high surface area contact with cables, surface area contact reduces cable strain and maintains cable shape and long-term performance. Our ladder tray has rungs spaced at a nine inch pitch, therefore, more rungs per section result in more cable surface area contact to reduce cable strain.

**cable strain  
reduced**

**welded steel  
construction**

**simple to  
configure**



## [installation]

TIA-607-C standard requires every piece of ladder tray needs to be bonded together and then bonded to a TGB/TMGB wall mounted busbar.

Ladder bonding jumper kits are available as singles or bulk packs. Brackets for holding ground conductors to ladder tray are another unique offering from Hubbell.





## [basket tray]

Basket tray can be easily cut, configured and bent using common hand tools for a professional installation while using few accessories.

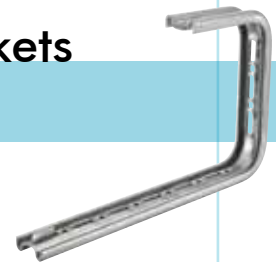
Tray cross sections are available in round and also a flattened wire that help to reduce cable stress by increasing the surface area of contact with the wire.

There are many sizes of basket tray that range in heights of 2" up to 8" and range from 4" up to 32" to provide many options based on data center cabling capacity requirements.

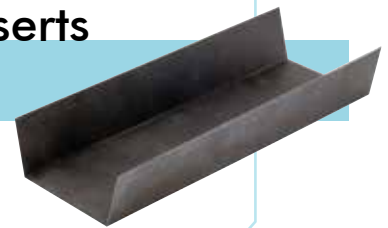
### shelf supports



### brackets



### inserts



## [accessories and installation]

For cables exiting basket tray, options include a vertical down which can be installed perpendicular or parallel to the tray and also a radius down that installs off of the side of the tray for a cable supporting radius.

Basket tray can be cut and configured in many ways to fit any application or obstruction in the data center and other applications.



# Power IT

## [power distribution units]

Hubbell has over 128 years of designing and manufacturing electrical receptacles and plugs. We combine our electrical device engineering and manufacturing expertise to create high quality and reliable power strips and power distributions units for the most critical power connections.

The unique requirements of active equipment require many configurations of power strips and that is why we offer NEMA and IEC configurations that supply up to 60 amps of power.

custom  
configurations

remote  
monitoring

surge  
protected



## [unique requirements]

As a manufacturer of plugs and receptacles used in our assemblies, our in-house process for building custom power strips delivers a high quality 100% tested solution to meet the

special requirements of equipment used in data centers. Ask for our custom power strip form for detailing your needs.

## [pin and sleeve]



Reducing energy consumption is a vital part of efficient, green operations. DC (Direct Current) is being adopted to reduce power consumption and decrease the amount of infrastructure needed to energize data center equipment. Hubbell Pin and Sleeve devices provide a means of connecting high load AC and DC power.

Hubbell developed IEC Pin and Sleeve devices configured for the UL1686 eight o'clock ground position for DC voltage. The line has been qualified by UL to the requirements of DC voltage. The solid one-piece pins are machined from solid brass for reliable electrical contact.

### plugs



### receptacles



### connectors



## [Twist-Lock®]



Insulgrip® 30 and 50 Amp Twist-Lock plugs and connectors meet escalating power requirements in the data center while ensuring critical power continuity.

- Super-tough nylon housing provides maximum impact resistance for long-term durability
- Stainless steel shroud protects blades against bending and breaking and restricts mis-mating
- Interlocking clamp style provides a more consistent, durable grip and better strain relief





## [lighting and controls]

Energy saving LED lighting and controls from Hubbell ensure a safe and efficient working environment. Be sure to consider the following when designing data center lighting:

- Use Hubbell's autonomous lighting controls to ensure lights are ON only when an area is occupied
- Specify adaptive passive infrared (PIR) sensing technology and focused lenses for each equipment row
- Make sure lights are centered in the isles and below any cable and equipment supports to maximize available light

**efficient  
control**

**quality  
illumination**

**reduced  
maintenance**



## [sensor selection and placement]

Data center environments are an occupancy sensing challenge due to high air flow and temperature differentials. Placing narrowly focused PIR sensors at the end of

each aisle provides an optimum coverage pattern that enables instant ON when someone enters the row and ensures lights remain OFF when no one is present.



## [LED strip lights]



LED strip lights from Hubbell Lighting offer many benefits for data center operations. These lighting fixtures are highly efficient, up to 124 lumens per watt, and long lasting with a 60,000 hour L80 lumen maintenance life.

LED strips greatly reduce the energy and maintenance required over traditional fluorescent fixtures. These strips are highly customizable with multiple options available for length, output, color temperature, mounting and light distribution.

**up to  
124 LPW**

**60,000 hour  
extended life**

**DesignLights  
Consortium™  
qualified**

## [lighting controls]



Data center operating environments are ideal for occupancy based controls due to intermittent use. Self contained occupancy sensors ensure only the rows with activity are illuminated, further enhancing savings. Hubbell offers a broad range of occupancy and vacancy sensors and lighting controls that meet the latest codes and standards, including ASHRAE/IESNA 90.1 and California Energy Commission (CEC) Title 24. Hubbell lighting controls can also provide LEED® points in categories like Sustainable Sites, Energy and Atmosphere, Indoor Environmental Quality and Innovative Design Process.



## [utp category 6a]

Data centers house a great number of bandwidth-intensive devices including servers, switches, storage systems, virtualization appliances and backup devices, all interconnected by a Category 6A cabling infrastructure. These devices require robust cabling solutions that support the increased demand for higher performance and flexibility. Hubbell cabling solutions offer reliable, scalable infrastructure that provides a migration path for ever emerging technologies.

Hubbell UTP cables are specifically designed and balanced to provide a high-performance, end-to-end system. All Hubbell cables exceed industry standards, both electrically and mechanically, while expanding the overall life span of the data center infrastructure.

**component  
compliant**

**DC power  
rated**

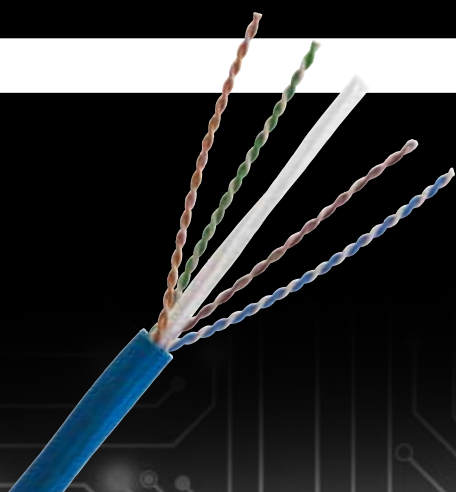
**reliable  
10GBASE-T**



## [specifying the right cable]

Specifying the right cable can present a challenge. Many networks that require voice and data will also require power. Power over Ethernet (PoE) was introduced over a decade ago and is now common in most networks. With the emergence of

higher power standards and demanding bandwidth requirements, the need for Category 6A cable becomes apparent. Category 6A provides an infrastructure solution that protects network traffic from noise and heat inherent with PoE.



## [fiber cable]



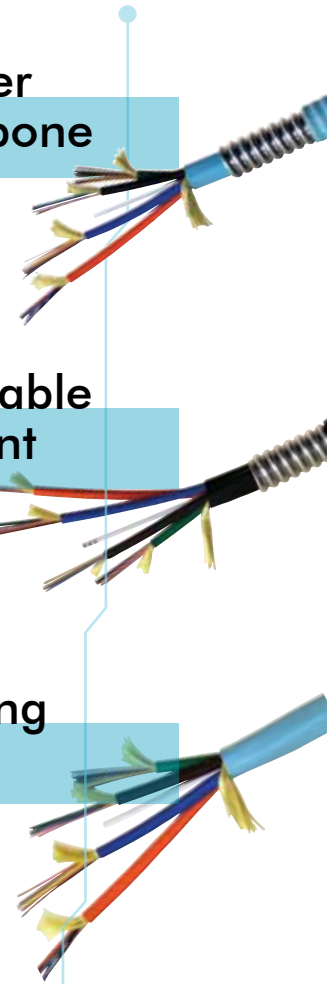
Hubbell's full line of tight buffer cable is available with OM3, OM4 and OS2 fibers in plenum and riser ratings. Tight buffered cables support building and cross-campus fiber backbone from the data center main distribution frame. Made in the USA with premium bend-tolerant fibers for maximum reliability.

Rugged aluminum interlock armored cable provides labor savings by eliminating inner duct tubing from cable pathways. Eliminating inner duct also relieves congestion in restrictive spaces while reducing both material and labor costs.

**10Gb/s per pair backbone**

**versatile cable deployment**

**labor saving solutions**



## [tight buffer vs. loose tube]



Indoor/outdoor tight buffer cables eliminate building entrance transitions, allowing direct deployment from underground duct to building backbone cabling infrastructure. Tight buffered cable also eliminates the need for loose tube break-out kits.

Labor savings results from ease of termination similar to indoor cable, and elimination of break-out kits used for loose tube cable termination. Another advantage of flame rated cable deployed between buildings is unrestricted indoor run distance, and elimination of entrance splices or interconnect terminations.



# Connect IT [Copper]



## [unshielded category 6A]

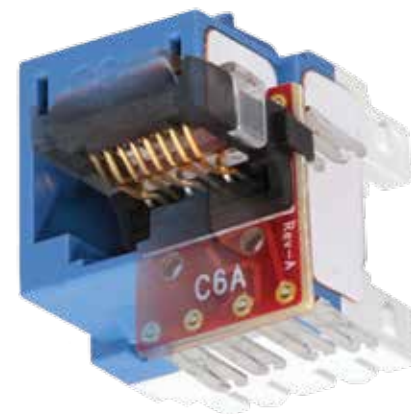
10GBASE-T is becoming the default server connection, delivering a cost effective, high bandwidth interface for today's data center applications.

Hubbell's well balanced design of the NEXTSPEED® Ascent 6A components provides a fully compliant system supporting 10GBASE-T transmission from 2-100 meters. System components are continuously third party verified to exceed all TIA and ISO requirements beyond 625MHz, ensuring interoperability with other component compliant products.

**margin  
guaranteed**

**short links  
supported**

**third party  
verification**



## [shielded or unshielded?]

Hubbell's unshielded Category 6A cabling provides a quick terminating, cost efficient solution that supports 10GBase-T applications. Upgrading to Hubbell's shielded Category 6A

system yields additional benefits of reduced cable diameters—eliminating the need for alien cross talk testing, enhanced security, external noise immunity and increased channel headroom.



## [shielded category 6A]



Ascent Shielded Category 6A is a tuned system of structured cabling components that delivers headroom over all TIA and ISO performance requirements providing an alien crosstalk-free environment.

The Ascent shielded system offers a transparent 10+ Gigabit signal path for current and future applications. This system also reduces installation time eliminating the need to punch down individual pairs. Hubbell's shielded solutions fully suppress EMI emissions, creating a secure network.

**eliminates  
interference**

**channel  
headroom**

**superior  
security**

## [pre-terminated assemblies]



BIDnet™ Pre-Terminated Assemblies are ideal for data center applications where speed, accuracy, reliability and performance are required. Assemblies are terminated in environmentally controlled factory conditions. They are 100% tested and certified to reduce installation time and labor associated with termination and on-site certification.

Assemblies are available shielded or unshielded, with multiple configuration options to suit any application.

# Connect IT [Fiber]



## [high density interconnect solutions]

Hubbell's ultra high density 1U x 144-port enclosure and cassette system is designed for maximum density local interconnect applications where space is a premium.

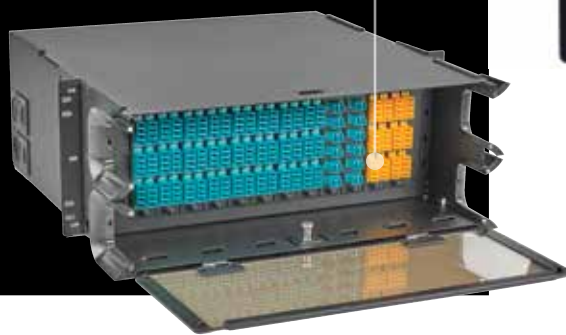
Customize any FCR enclosure into a high density solution using 24-port MPO cassettes. Hubbell offers a wide range of local interconnect enclosures and modular panel densities for a robust installation.

Custom made-to-order fiber trunk assemblies and a full range of stocked MPO cassettes provide a complete Mission Critical 10G/40G/100G channel solution. Quality, performance, and reliable delivery define Hubbell's reputation for supplying data center cabling infrastructure.

**ultra high  
density**

**quick  
deploying  
assemblies**

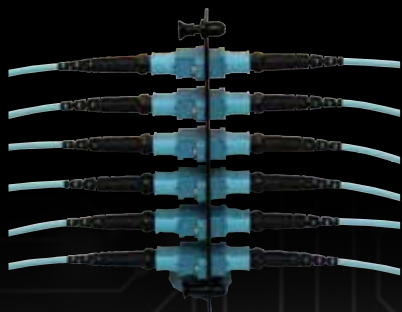
**scalable  
bandwidth**



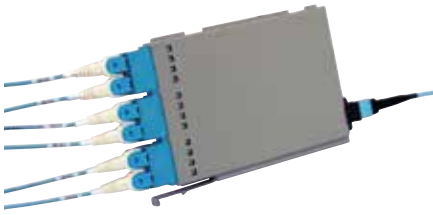
## [migration to 40, 100 and 400G]

Hubbell offers 40G-ready MPO cabling infrastructure for seamless migration to 40G/100G and beyond. Future migration is supported with complete

40G-ready MPO cabling solutions. Pre-terminated MPO channel solutions are offered for 40G and 100G consolidation or new deployments.



## [MPO cassettes]



Ultra compact HD-series MPO cassettes work as a system with the high density 144-port/1U solution. The modular cassette design features a slim 12-port LC interface for a flexible and scalable network partitioning solution with future migration capability.



Universal LGX-compatible OC-series MPO cassettes in 12 or 24-port densities provide a user configured solution with any Hubbell FCR-series enclosure. Made in the USA with premium quality fiber and components for a reliable interconnect solution from 1U to 4U rack space. The modular design features a 12-port LC interface for convenient network partitioning, flexibility and future migration.

**100%  
factory tested**

**bend insensitive  
fiber**

**premium ceramic  
components**

## [fiber cable assemblies]



Custom MPO and LC fiber trunk assemblies are made to order in the USA with small form micro distribution cable and premium quality ceramic components. Rugged epoxy-filled breakout junctions and precision factory termination deliver long term mission critical network reliability.





## [physical security]

Hubbell offers a wide range of devices to protect equipment and access from unauthorized access and theft. Our products offer varying levels of protection that block, create barriers, prevent tampering and offer full network access security.

Perfect for multi-use and co-location areas, security enclosures offer rack mounted protection of equipment while maintaining cable management provisions and ease of moves, adds and changes.

Locked patch cords offer protection from accidental disconnect and the port blocker offerings protect jacks from minor environmental damage and dust.

**physical  
protection**

**tamper-  
resistant**

**configurable  
capacity**



## [port blocker]

Hubbell's universal RJ-45 port blocker provides a layer of physical security by preventing unauthorized access to unused ports. It also protects unused ports from foreign debris and objects.

The blocker is easily removed by opening the front hinged cover and then inserting the supplied extraction tool.



## [SecureIT™ patch cords]



SecureIT patch cords offer two levels of protection from unintentional or unauthorized removal. Unintentional removal protection requires users to pinch and disengage the locking mechanism before depressing traditional plug latch.

The unauthorized removal protection option requires use of the provided removal tool to disengage the locking mechanism. This ensures only authorized users with the tool can remove the patch cord.

**unintentional  
removal protection**



**unauthorized  
removal protection**



**RJ-45 or  
LC duplex**

## [cabling for security and surveillance]



Hubbell's selection of armored and outside plant cables is ideal for providing connectivity to security cameras and access control stations. Additionally, Hubbell HI-Impact connectors and housings are designed to withstand the toughest conditions associated with outdoor, exposed and remote areas of a facility.





# Organize IT

## [cable management]

Hubbell's full line of cable management solutions offer three levels of routing, securing and managing cables inside the data center. A professional and organized network requires special consideration of which cable managers will work best for a low to high volume cable installation.

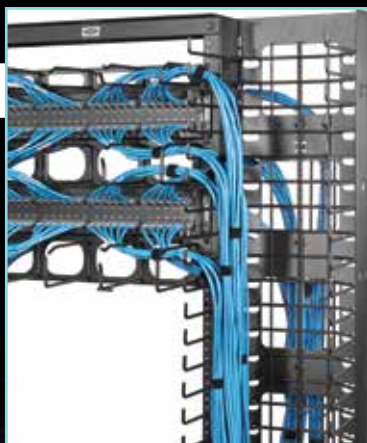
A consistent design aligns patch panel adapter blocks with horizontal cable manager fingers to prevent patch cord kinks. Additional rear cable support offers a generous bend radius for horizontal cabling.

Each series of cable managers has verticals that correspond to horizontals so that there are more options as more capacity is required.

**user  
friendly**

**easily  
configured**

**consistent  
aesthetics**



## [capacity for the future]

Size to your future needs to ensure capacity is available for both planned and unforeseen needs. Every series of cable manager has a cable capacity chart to aid in

the selection of the best series for the application.

## [cable management series]



The M Series is designed to meet the needs of the most demanding installations of high cable volume and cable support at every rack unit. Daily moves, adds and changes are simple and organized due to the strong focus on installer actions.

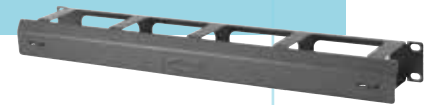
The S Series focuses on the standard medium volume cable installation. This series has movable cable spools that have generous bend radius for cable.

The SD Series is an economic option for basic installations that have requirements more focused on a compact design.

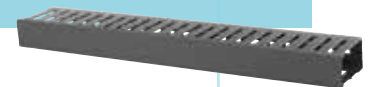
### M Series



### S Series



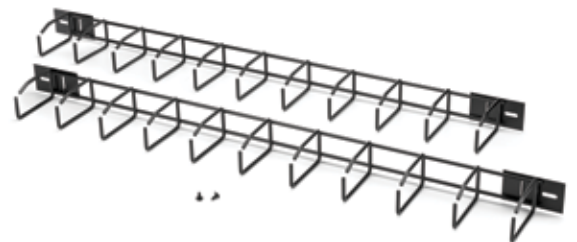
### SD Series



## [installation accessories]

Additional cable management accessories provide cabling with additional strain relief.

Organized cabling allows for easier tracing and future moves, adds and changes.





## [grounding and bonding]

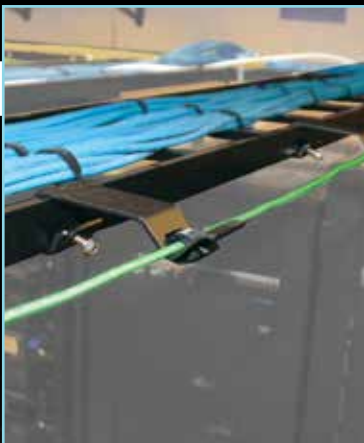
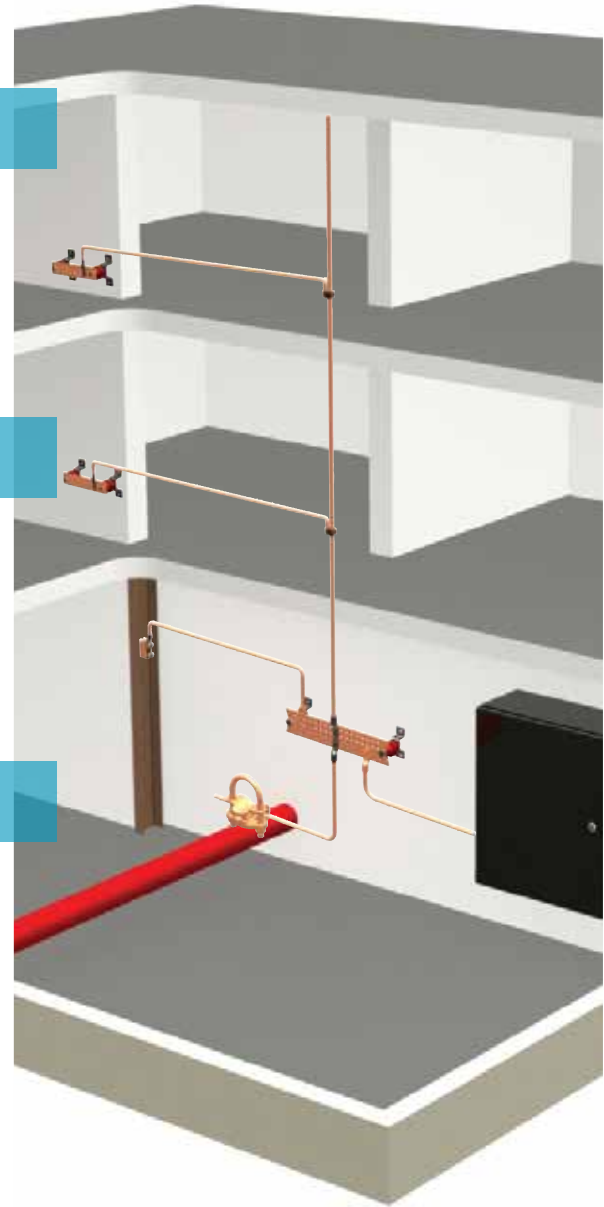
A properly bonded and grounded data center ensures that equipment performs to the designed specification without interferences from EMI and RFI. Data center equipment has requirements for electrical protection and Hubbell has a standards compliant offering to ensure proper equipment protection.

As technology moves forward there has been an increase in the concentration of equipment in data centers and this has grown the need for a lower resistance grounded network to remove stray electrical voltages. Irreversible compression lugs and taps guarantee that the installation will maintain a low resistance bonded pathway to ground.

**equipment  
protection**

**standards  
compliant**

**network  
performance**



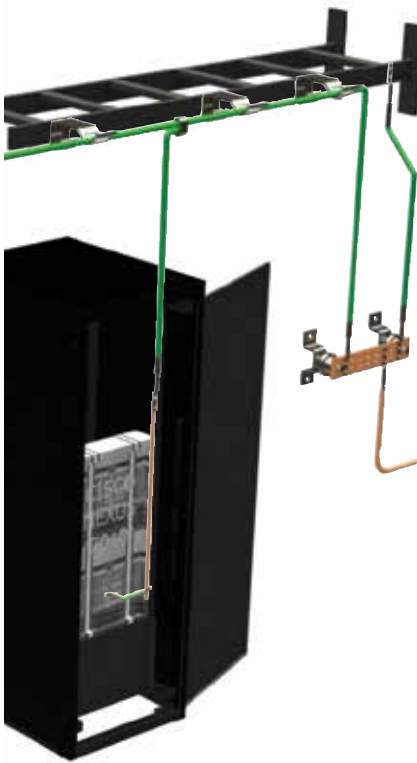
## [bonding conductors]

Bonding conductors should be sized according to distance versus gauge table and routed in an efficient manner to the busbars. Hubbell Premise Wiring's full

Grounding and Bonding product offering has lugs and taps sized from the smallest to largest standards recommendations.



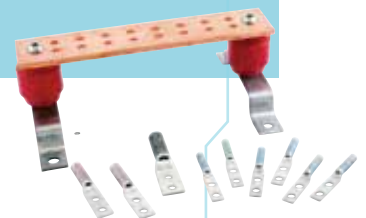
## [standards compliant bonding]



Copper busbars serve as the central hub within a room as the collection point for stray electrical currents. Tin-plating can lower the resistance on the surfaces that bond lugs to the busbar. For compliance, lugs must match the hole pattern on the busbar to ensure manufactured compatibility.

Conductor kits are an easy solution to bond ladder tray, equipment and metal components to busbars. All substantial metals in the data center should be bonded to a wall mounted busbar via conductors with compression connectors.

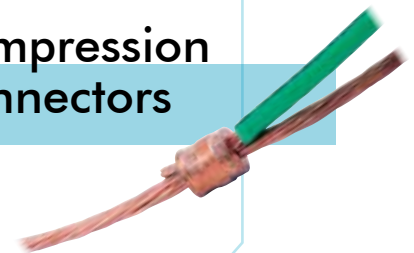
### busbars



### conductor kits



### compression connectors



## [raised floor options]



Clamps installed underneath the raised floor in the data center act as a bonding device for the floor while also supporting an easy-to-access bonding network.



# Support IT

## [comprehensive warranty coverage]

Hubbell Premise Wiring cabling systems are supported by our MISSION CRITICAL® program, the industry's most comprehensive 25-year warranty coverage.

- Guaranteed to meet IEEE standard/application specified to operate over Category 6A and fiber cabling
- Product replacement performance guarantee
- Independent, ongoing third party (ETL) verified performance program
- Hubbell trained network of global certified installers

**certified  
installers**

**application  
assurance**

**25-year  
warranty**



## [certified installers]

Each Hubbell Certified Installer first completes an in-depth, BICSI accredited certification program, covering current installation practices and standards. Hubbell Premise Wiring's industry best products, installed by globally trained certified

installers, provide the end users with the greatest return on investment. Hubbell's MISSION CRITICAL® 25-year warranty assures customers that their newly installed cabling infrastructure system meets or exceeds all industry standards.



## [online resources]

Available 24/7, online brochures, data sheets, the full line catalog and other literature provide detailed information on products and services:

- Market applications
- Solutions
- White papers
- Application guides
- BIM models

Customer drawings are searchable by part number or product family and are downloadable in DWG or PDF format.

Extensive video library features:

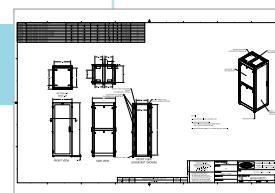
- Installation instructions
- Application guides
- Product overviews

Interactive eTours illustrate product applications within a variety of vertical markets

## product guides



## customer drawings



## videos



## [technical resources]

UL/ETL Certified Laboratory:

- Component testing
- Link/channel testing
- Active network testing
- Mechanical testing
- PoE testing



Partnerships:

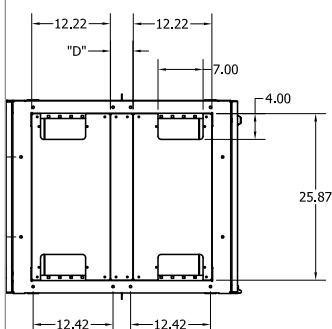
- Cisco® Developer Network
- Hitachi Cable America®
- Extreme Networks®



**HITACHI**  
Inspire the Next



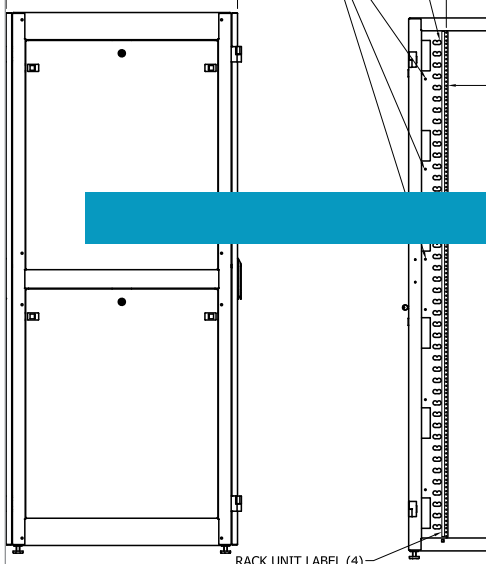
6	1	5
OUNTING HEIGHT "C"	DIM. "D"	TOP PANEL "P" SIDE COVER "R"
78.81	N/A	25.85 N/A 4
78.81	3.47	29.85 4"W TOP PAN 4
75.31	N/A	25.85 N/A 4
75.31	3.47	29.85 4"W TOP PAN 4
78.81	N/A	25.85 N/A N/A
78.81	3.47	29.85 4"W TOP PAN N/A
75.31	N/A	25.85 N/A N/A
75.31	3.47	29.85 4"W TOP PAN N/A
78.81	10.47	35.85 10" TOP PAN 4
78.81	15.72	41.85 16" TOP PAN 4
84.06	10.47	35.85 10" TOP PAN 4
84.06	15.72	41.85 16" TOP PAN 4



ACCEPTS CABLE MANAGEMENT SPOOLS, SOLD SEPARATELY (ICKSSx)

ACCEPTS VERTICAL BUSBAR, SOLD SEPARATELY (HBBVR36KT)

"B"



SIDE VIEW

FRC  
(DOOR)

G	19441	04/14/14
REV.	ECN	DATE





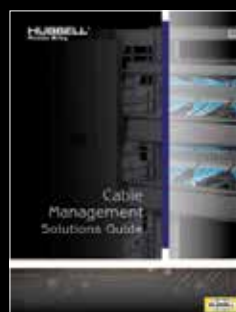
[www.hubbell-premise.com](http://www.hubbell-premise.com)



[your complete online resource]

Find what you need quickly with our multi-functional online value-added tools—print, zoom, search and download required information anytime, anywhere.

[related literature]



**HUBBELL®**  
Premise Wiring

[www.hubbell-premise.com](http://www.hubbell-premise.com)

