

Developing the Green Data Centre

Products and Solutions to Support Energy Efficiency

Ordering Guide



Supporting the Green Data Centre Table of Contents



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Turn on a television or open a newspaper today and one can't miss the fact that environmental issues and energy conservation are on minds of everyone. Over the past 10 to 20 years, the inhabitants of Earth are collectively consuming more energy at a faster rate than ever before. No where is this more apparent than in the data centre where power consumption has doubled in the past five years and is expected to rise at a steeper rate of 76% from 2005 to 2010. With the demand for data centre resources growing each year and the current trend of data centre consolidation, the stress these facilities place on the environment is simply unsustainable. Not only can expanding data centres be costly to the environment, they directly affect a company's bottom line.

By 2010, IDC predicts that every \$1 spent on new servers will require 71 cents on power and cooling. This massive increase has led to the formation of industry consortiums such as The Green Grid™. These consortiums are specifically focusing their efforts on lowering power consumption as well as promoting the adoption of energy efficient standards, measurements and technologies for the modern data centre.

There are, however, simple, cost effective ways to drive down power and cooling consumption in the data centre. ADC KRONE offers numerous products and solutions that will not only optimise a data centre's performance, but also directly affect these environmental issues. ADC KRONE has solutions that are produced with fewer raw materials and are designed to increase airflow and energy efficiency. This commitment to lowering power consumption can be found in the following ordering guide which details the products and solutions ADC KRONE offers to assist with today's energy efficient data centre.

Developing the Green Data Centre

Airflow Management in the Data Centre

Improving the overall airflow in your data centre is critical in reducing your power consumption. The way to do this efficiently and effectively is to instill proper cable management techniques. ADC KRONE offers a wide variety of cable management products and solutions that extend from the rack through out the entire data centre.

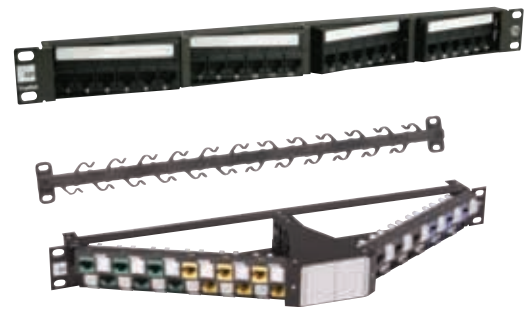
Data Centre Cable Management Techniques

Passive airflow is key in keeping your cooling costs at a minimum. All cabling and connectivity within the data centre needs to be deployed with not only cooling in mind, but proper bend radius protection, well-defined cable routing paths, room to work on connectors and cables without affecting adjacent circuits or ports, and physical protection for equipment cables, intrafacility cable, patch cords, and jumpers. Without end-to-end cable management, some of the problems encountered include cables stepped on and piled-up in raceways, maximum bend radius exceeded, difficult connector access, and hours to trace cables, all of which increases the time required for moves, adds and changes as well as blocking passive airflow adding to your cooling costs.

The key to a well managed data centre that promotes proper airflow is investing in a complete cable management system. ADC KRONE offers the following Highly reliable and resilient cabling products that will help to "Green" your data centre.

Angled Panels

ADC KRONE's TrueNet® Angled Right/Left panels offer superior performance and flexibility. Unlike fixed-angle panels, ADC KRONE's patented solution combines the ability to dynamically angle connections either right or left in a low profile, high-density design. Low profile dynamic angling allows for greater flexibility and use in cabinet environments and improved cable management.



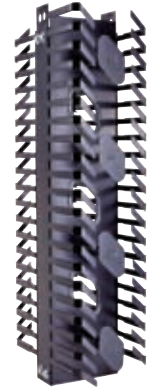
Ordering Information

Description	Product Number
Patch panels	
24-port angled patch panel 1RU unloaded	TPNP-24APC10-UN
24-port angled patch panel 1RU loaded with black CopperTen jacks	TPNP-24APC10-BK
Jack; Individual RJ45 UTP modular 568A/B jack	6830 1 835-XX*
CopperTen cable manager bracket; Wire management bracket for cabinets in data centre applications	TPNP-NNC10-WM-BKT
Dynamic right/left angle patch panels; Patented right/left angle eases stress on patch cords allowing for easy cable management; 45-degree silver-plated IDCs provide secure reliable gas-tight connections; Wire can be terminated with either a KRONE or 110 tool; Universal A/B wiring label	
1 RU 24-port	PP24AC6T
2 RU 48-port	PP48AC6T

*Replace XX with: 01 = White 02 = Ivory 03 = Gray 04 = Black 05 = Red 06 = Blue 07 = Green 08 = Yellow 09 = Violet 10 = Orange

Glide Cable Management

ADC KRONE's Glide Cable Management product is an integrated front, rear, horizontal, and vertical cable manager. Its Patented rib cage design eliminates the need for horizontal support trays and bars. Manufactured for density, it will support up to 912 ports on a single rack and has built-in bend radius protection ensures network integrity. The Glide Cable Management system is designed for quick and easy moves, adds, and changes and includes optional slack storage managers.



Glide cable manager with slack managers

Ordering Information

Description	Product Number
Glide cable manager, vertical mount; to equip both sides of a 7-foot rack, order two glide cable manager units	
6", front only, without slack manager	ADCCMVIB06F-2
6", front only, with slack manager	ADCCMVIBS06F-2
6", without slack manager	ADCCM-06
8", without slack manager	ADCCM-08
10", without slack manager	ADCCM-10
12", without slack manager	ADCCM-12
8", with slack manager	ADCCMS-08
10", with slack manager	ADCCMS-10
12", with slack manager	ADCCMS-12
Crossover troughs	
2 RU	ADCCMTG02
4 RU	ADCCMTG04
Black metal covers	
41" x 6", four per pack	ADCCMVIBC06B4
41" x 8", four per pack	ADCCMVIBC08B4
41" x 10", four per pack	ADCCMVIBC10B4
41" x 12", four per pack	ADCCMVIBC12B4
Black metal cover; hinged 41" x 6", two per pack	ADCC06-2



Glide cable manager shown in cabinet



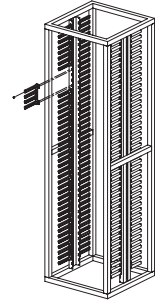
Cover in black metal

Ordering Information

Description	Product Number
Glide cable manager; cabinet mount, ships 4 per pack	
6" x 10 RU	ADCCMVIB-CB10-4
6" x 20 RU	ADCCMVIB-CB-4
3" x 20 RU, with cable retention	ADCCMVIB-3CB20-4
6" x 20 RU, with cable retention	ADC CMVIB-6CB20-4
Crossover troughs; black	
2 RU	ADCCMTG02
3 RU, 23" rack	ADCCMTG04-23
4 RU	ADCCMTG04
Horizontal cable managers	
2 RU	ADCCMHIB-2U
3 RU	ADCCMHIB-3U
4 RU	ADCCMHIB-4U
3 RU, with slack managers	ADCCMHIBS-3U
4 RU, with slack managers	ADCCMHIBS-4U
Rear cable management bar, 19"	
1" extension	ADCCMRSB
4" extension	ADCCMRSB-4
Slack manager	ADCCMVIBSP
Stabilizers	
6.18"	ADCCMVESB06
8.38"	ADCCMVESB08
10.18"	ADCCMVESB10
12.18"	ADCCMVESB12
Extender brackets, 19" to 23"	
1 RU	EB-17B
2 RU	EB-35B
4 RU	EB-70B
7' equipment racks	
Self-assembly aluminum relay rack, 3" channel, 19" EIA	
Black	ADCRACKBLK73
Brushed aluminum	ADCRACKMF73
Welded steel relay racks; 3" channel, 19" EIA, black	
ADCRACKBLK73WS	
Welded steel relay racks; Zone 4 rated	
Unequal flange, 19" EIA	ADCRACKBLK73UE
Network unequal flange, 23" EIA	PWUEF-7ERN-BLK

* Equips standard 7' cabinet with front or rear cable management. Order two 4-packs to equip front and rear of cabinet.

** Stabilizer used at end of line-up for each vertical integrator section.



Installation Drawing for Glide Cable Manager, Cabinet Mount



Glide Cable Manager, Cabinet Mount



2 RU Crossover Trough



4 RU Crossover Trough



Horizontal Cable Manager



Stabilizer



Slack Manager

Developing the Green Data Centre

Airflow Management in the Data Centre

Riser Guide

Because cable management requirements change with network requirements, ADC KRONE offers a riser guidance system, designed to provide cable management where you need it, when you need it. RiserGuide is modular and easy to both install and remove, allowing for flexible cable

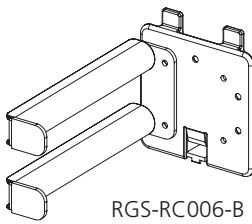
management, bend radius protection and full network optimisation. The system includes various components that can be installed anywhere on the riser including storage spools, radius limiters and cable guides.



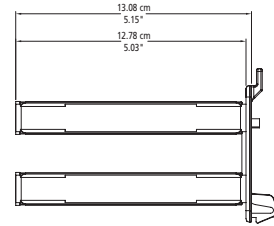
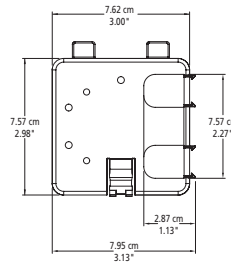
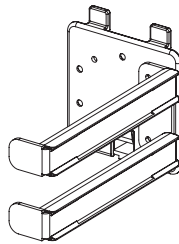
Installation



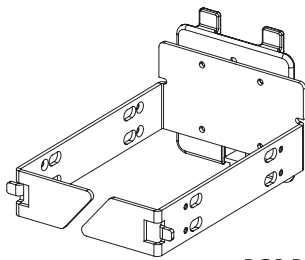
Removal



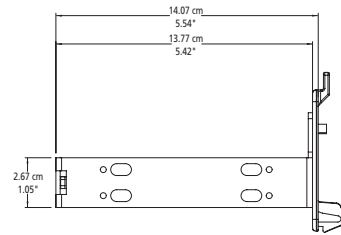
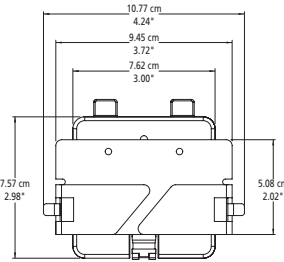
RGS-RC006-B



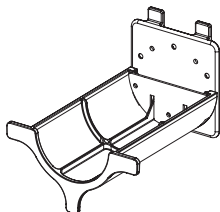
Cable Guide Bracket



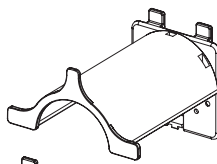
RGS-RC005-B



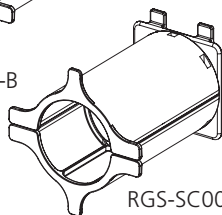
Edge Protectors



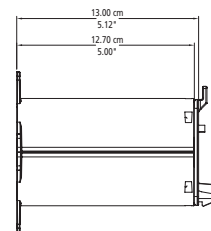
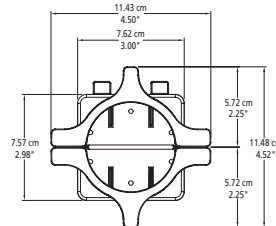
RGS-SC003-B



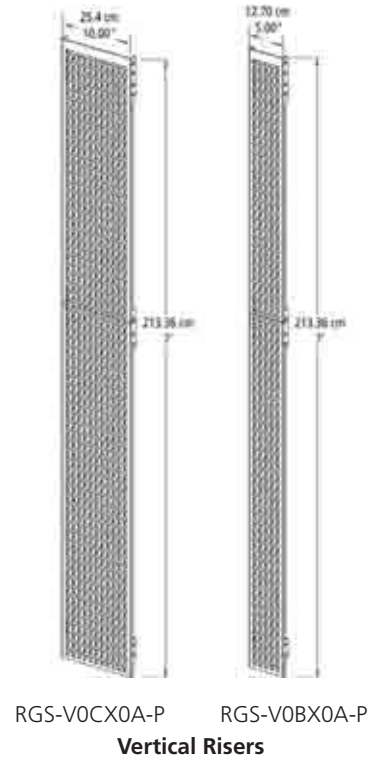
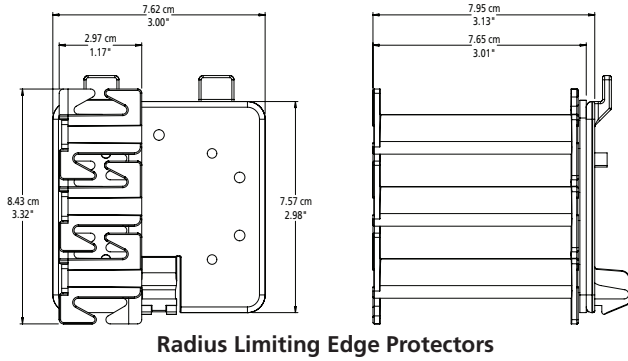
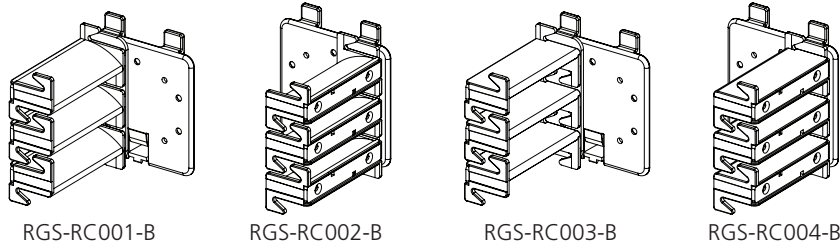
RGS-SC002-B



RGS-SC001-B



1.5 inch Bend Radius Spools



Ordering Information	
Description	Product Number
Cable guide bracket	RGS-VC001-B
Edge protectors	
for left-hand cable entry/exit	RGS-RC005-B
for right-hand cable entry/exit	RGS-RC006-B
1.5" bend radius spool	
Full spool	RGS-SC001-B
Half spool – top	RGS-SC002-B
Half spool – bottom	RGS-SC003-B
Radius limiting edge protector	
Fibre exit – right/down	RGS-RC001-B
Fibre exit – left/down	RGS-RC002-B
Fibre exit – right/up	RGS-RC003-B
Fibre exit – left/up	RGS-RC004-B
Vertical risers	
7' x 10"	RGS-V0CX0A-P
7' x 5"	RGS-V0BX0A-P

Developing the Green Data Centre

Airflow Management in the Data Centre

Another way to move to a more energy efficient data centre is to place cables in overhead channels as opposed to raised floors, freeing up more plenum space to improve air-flow and reduce the pressure to try and push more cool air. Ample horizontal cableways are essential in maximizing the air flow in your data centre and supporting future growth and manageability. Horizontal cable tray installed above the racks creates a protected pathway as cable traverses between functional areas and equipment racks in the data centre. Good routing systems will provide adequate support, keep fibre separate from copper cable, protect from out-of-tolerance bends, and promote neat, easily accessible runs. ADC KRONE offers the industry's most comprehensive cable raceway system. ADC KRONE's Fiberguide® Fibre Management Systems offer the greatest breadth of raceway products in the industry.

Ordering Information

For specific ordering information please reference the TrueNet® India catalogue at www.adckrone.com/in

Features and Benefits include:

- **Speed of Installation** – Fiberguide systems feature a variety of products that allow for quick and easy installation. Express Exit™ drops as well as tool-less products including Snap-Fit™ junctions, snap-on covers and new-hinged cover options save valuable time for installers.
- **Speed of Deployment** – The Express Exit system enables new drops to be added or removed quickly and easily. A drop can be added into a fully loaded raceway in seconds—without cutting.
- **Raceway Flexibility** – Fiberguide features 38 support structures, over 75 fittings, multiple drop options and several other components to suit any application you create.
- **Cable Protection** – ADC KRONE's broadband expertise translates into maximum protection for your network. Minimum bend radius is maintained throughout the system regardless of the raceway size.
- **Strength and Durability** – 100% raceway reliability—stands up to any challenge



Developing the Green Data Centre

Airflow Management in Cabinets

Today, servers can handle more and more terminations, causing a lot of congestion due to cables. This congestion can restrict airflow to the cabinet causing the need to move more cool air around the equipment. With data centre floor space still at a premium, there is a need for more dense cabinets. This move to high density does come with a price. The cost to cool the data centre will grow right along with your density.

The following is an ADC KRONE solution that can solve both your density and airflow concerns in your cabinets.

Cable Management Solutions for Active Platforms

ADC KRONE's TrueNet® Cable Management Solutions for Active Platforms is a family of cable management solutions for active equipment. These solutions enable service providers to maximise their capital equipment investment and minimise operational costs. These solutions allow you to manage data centre space efficiently, particularly when space is at a premium. In addition, you are able to maximise the operational equipment life by incorporating thermal management best practices and minimise network downtime and flexibly manages cable—greatly simplifying moves, adds and changes.



Ordering Information

For more information on this solution, contact ADC KRONE. See contact details at back cover of this brochure.

For best results, provide the following information:

- Type of platform and quantity per rack/cabinet
- Maximum cable configuration (quantity and type of cable)
- Type of mounting environment – rack/cabinet dimensions
- Overhead or under-floor cable routing
- Type of configuration – cross-connect or interconnect

ADC KRONE's TrueNet Cable Management Solutions for Active Platforms Feature high density cabling capacity and management in addition to providing physical protection and accessibility of cables for maintenance and proper thermal air flow. The solution separates routing channels for fibre and copper cables providing physical protection and bend radius control of fibre cables. Finally the system allows for future growth while incorporating slack storage and fibre management practices.

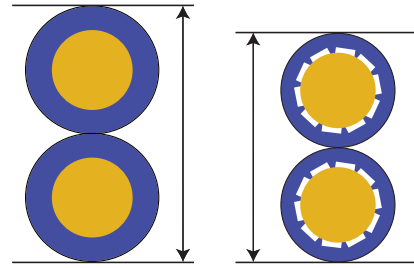
The TrueNet Cable Management Solutions for Active Platforms provide ample vertical and horizontal cable management. Proper management not only keeps cabling organised, it also removes the obstacles to air movement. A strong cable management system provides, cable routing paths, cable accessibility, and physical protection. ADC KRONE products incorporate all of these elements, allowing your network to realise its full competitive potential.

Developing the Green Data Centre

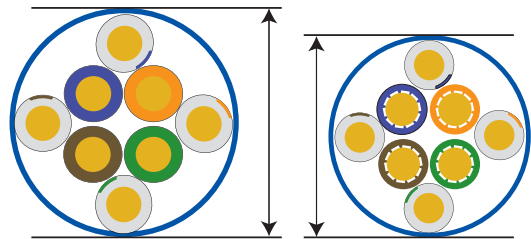
Selecting Green Cable

Cable with a smaller diameter will contribute to improved airflow and reduced energy costs. Yet for the truly environmentally conscious individual, copper cable made with ADC KRONE's patented AirES® (Air Enhance System) technology offers another important benefit—less material is used for cable construction. By combining channels of air with traditional FEP insulation material, the net effect of AirES is superior electrical performance and smaller outside cable diameter. In addition AirES cable improves data throughput, saves space, eases installation and reduces the danger of fire and smoke. Through a unique design and advanced manufacturing techniques we are able to build AirES cable using air as a conductor insulator. This groundbreaking process results in a cable that incorporates superior performance while reducing overall size and amount of raw materials used in cable construction.

ADC KRONE offers a wide variety of copper cable with the AirES Technology for transmission of the most critical data transmissions. The cable portfolio includes CopperTen® Augmented Category 6 cable for the emerging 10 Gpbs Ethernet over UTP standard, as well as standards-compliant cable for Category 6 applications. Our high performance copper riser data cables for backbone and horizontal applications are produced by highly automated manufacturing processes that ensure consistent quality and dependability with superior electrical performance.



Smaller twisted pairs....



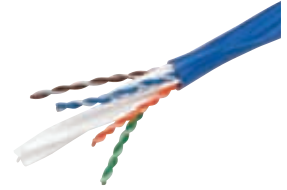
...Equals smaller cables

Air channels allow for a smaller diameter cable while also using less FEP insulation.



CopperTen® Augmented Category 6 Cable

CopperTen® Augmented Category 6 Cable with AirES Technology, the world's first UTP structured cable to enable 10 gigabit Ethernet transmission over a full 100 meters. The patented "inside out" filler provides the necessary air pockets to cancel alien crosstalk between cables in a bundle, rotates along its length and creates a large air footprint generating more separation between cables. Where ADC KRONE's Augmented Category 6 Cable is most beneficial is in its 22 percent reduction in cross sectional area when compared to typical Cat6a cable. Again, using less material and allowing increased airflow for cooling.



Features:

- Unique oblique elliptical offset filler for improved alien crosstalk
- Features AirES® technology
- Manufactured with lead-free materials

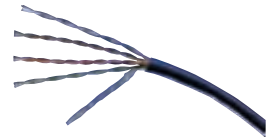
Ordering Information

Description	Product Number
4-pair riser data cable	10G-A6TR-XXYY

XX = Jacket Color: BL = Blue, WT = White, GY = Gray, GN = Green, YL = Yellow, RD = Red
YY = Length: 02 = 1000 ft, 04 = 2000 ft, 05 = 2500 ft

CopperTen® Category 6 Cable

ADC KRONE's TrueNet Category 6 Cables also with AirES Technology have a cross-sectional area reduction of up to 32 percent smaller than traditional cable. Each cable is also manufacture with the same innovative and trusted design as the CopperTen Augmented Category 6 Cable for superior performance.



Features:

- Patented impedance matching for zero bit-errors
- Features AirES® technology
- Manufactured with lead-free materials

Ordering Information

Description	Product Number
4-pair riser data cable	TN6SR-XXYY

XX = Jacket Color: BL = Blue, WT = White, GY = Gray, GN = Green, YL = Yellow, RD = Red
YY = Length: 02 = 1000 ft, 04 = 2000 ft, 05 = 2500 ft, RB = 1000 ft reel in a box

A Green data centre can be achieved when you partner with a company who believe in its importance as much as you do. ADC KRONE understands the needs of the modern Data Centre, but also realises the importance of the environment. Simple steps can be taken to conserve energy use and reduce cooling costs. Understanding what smaller cables, proper cable management and custom solutions can ultimately do to assist your efforts to go Green and saving money. ADC KRONE's innovative products and solutions can help you every step of the way. Let ADC KRONE be your partner in your Data Centre and in helping the environment.

If you are considering a move to a more energy efficient data centre, ADC KRONE has the resources to assist you along the way. Please reference ADC KRONE's planning guide for Creating the Green Data Centre.

For more information or to receive a copy of the Creating the Green Data Centre Planning guide, contact ADC KRONE at 1-800-425-8232, email at truenetindia@adckrone.com or visit www.adckrone.com/in

Moving optical fibre cables into overhead raceways, opens up airflow underneath floor panels



Developing the Green Data Centre



KRONE



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