

400V DC Power Solutions from Emerson Network Power

Innovative Power Architecture for Data Center and Telecommunications Sites

The Challenge

Data center and telecom operators are challenged to grow their infrastructure to keep pace with the exponential increase in data traffic and computing. Deploying solutions that reduce costs, streamline infrastructure footprint, increase energy efficiency, and maintain high availability is the key to keeping pace with consumer demand.

The Path to Optimized Site Architecture

As the nature of the telecommunications and computing industry evolves, so too must the infrastructure that supports it.

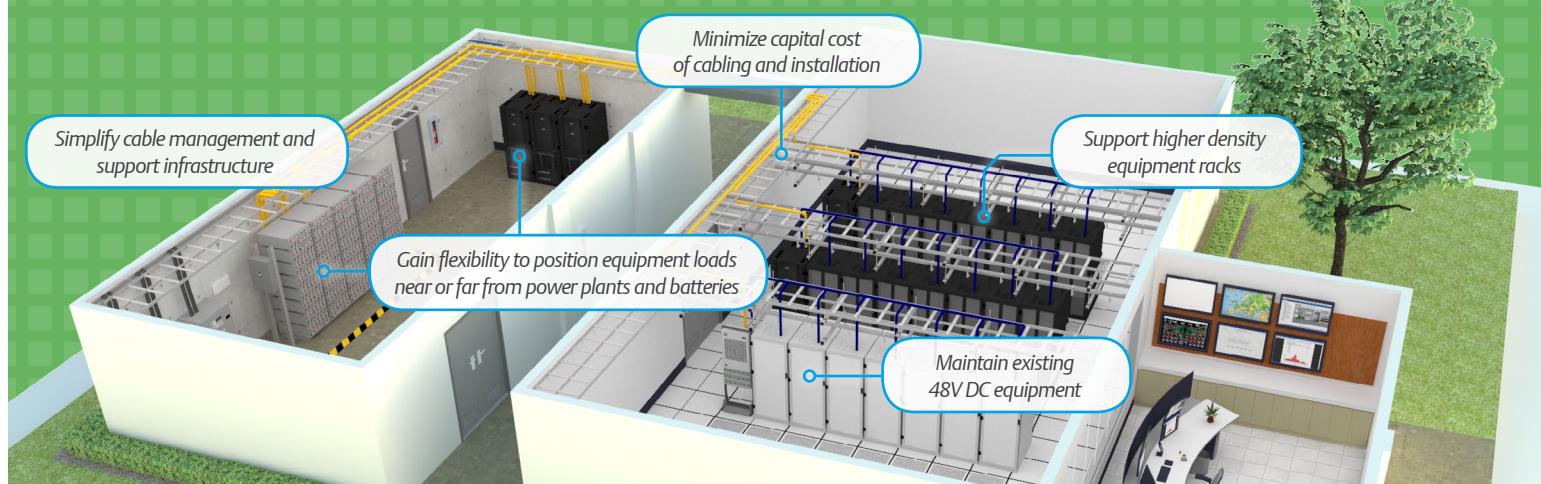
Whether you are trying to contain expanding costs, increase energy efficiency, streamline power distribution, or manage an increasing mix of telecom and IT equipment, 400V DC power technology can enable meeting your site goals. This technology combines the proven benefits of 48V DC power – modularity, scalability, ease of integration – with the cable and installation savings benefit of higher voltage distribution.

400V DC power is designed to ensure the highest levels of efficiency and reliability. Based on a flexible architecture, 400V DC power can be implemented at a wide variety of different telecom and data centers sites. Whether your site equipment powering needs include 400V DC, 48V DC, or AC power – or a combination of all three – 400V DC can be the backbone infrastructure of a cost effective and efficient site design.

Let Emerson Network Power's experts work with you to optimize your site's power architecture to meet the needs of the 21st century.

Challenges	Consequences	Opportunities
Capital cost of core site expansion: <ul style="list-style-type: none">■ Distribution cabling and installation costs■ Cable management and support infrastructure	<ul style="list-style-type: none">■ High capital expenditure	<ul style="list-style-type: none">■ Significantly reduce cabling and installation costs by distributing power at 400V DC as compared to 48V DC■ Simplify distribution cabling to free up space and streamline support infrastructure
Site complexity: <ul style="list-style-type: none">■ Increased mix of AC and DC powered equipment at sites	<ul style="list-style-type: none">■ Complicated power distribution architecture■ Multiple battery plants	<ul style="list-style-type: none">■ Deploy 400V DC as main power distribution and convert to 48V DC and AC power as needed■ Consolidate site back up on single power bus
Dimensioning and operation of AC powered data centers: <ul style="list-style-type: none">■ Over-sizing of UPS■ Harmonics and phase/voltage balancing	<ul style="list-style-type: none">■ High capital expenditures■ Reduced availability due to operational issues	<ul style="list-style-type: none">■ Build out power capacity in a scalable fashion to match site power needs with modular 400V DC power systems■ Simplify power chain architecture with easy to integrate 400V DC systems
Controlling operational cost: <ul style="list-style-type: none">■ Improving energy efficiency■ Integrating renewable resources	<ul style="list-style-type: none">■ High operating expenses■ Pressure to be "greener"	<ul style="list-style-type: none">■ Improve power chain efficiency by reducing conversions back and forth between AC & DC power■ Simplify the integration of renewable energy sources on-site

Implement 400V DC power in your telecom site to...



400V DC Power Solutions for Telecom Sites

Telecom Sites

400V DC power solutions reduce capital costs at core telecom sites and support infrastructure challenges by significantly reducing cabling relative to 48V DC power distribution. Optional 400V to 48V DC-DC conversion enables the continued use of 48V DC powered equipment, while capturing infrastructure savings on long cable runs.

Reduce Distribution Infrastructure & Enable Flexibility

The NetSure 9500 400V DC power system converts AC power to 400V DC power. By distributing the power at a higher voltage, the current is cut by a factor of seven compared to 48V DC [Figure 1]. The result is an 80%+ savings for the material and labor required to distribute power across your core telecom site. In addition to reducing the costs to build or upgrade your site, it also eases site congestion and allows greater flexibility in the placement of power systems and batteries relative to equipment loads. By minimizing cabling, 400V DC distribution makes it easier to centralize battery plants in a separate, climate controlled room, reducing the need for cooling in the equipment rooms.

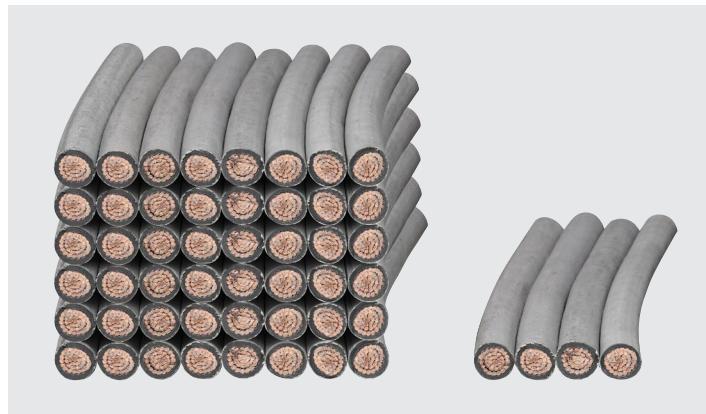


Figure 1. Cable required to transport 200 kW of current 245 feet with 48V DC compared to 400V DC.

eSure™ Rectifiers

At the heart of Emerson's 400V DC power systems is the 15kW eSure rectifier, with 97% peak efficiency and full galvanic isolation. Because the eSure rectifier is hot-swappable, rectifiers can be added or switched out for field expansion or maintenance without disrupting the power distribution. This allows you to achieve very high levels of power availability with redundant rectifiers in the system.



NetSure™ 9500 Series

The NetSure 9500 is an efficient, reliable AC to DC power system for critical 400V DC power applications. A flexible and modular design enables deployment in a variety of site configurations and allows for scalable buildouts to avoid stranded capacity. Each power module has a capacity of 120kW (105kw N+1).

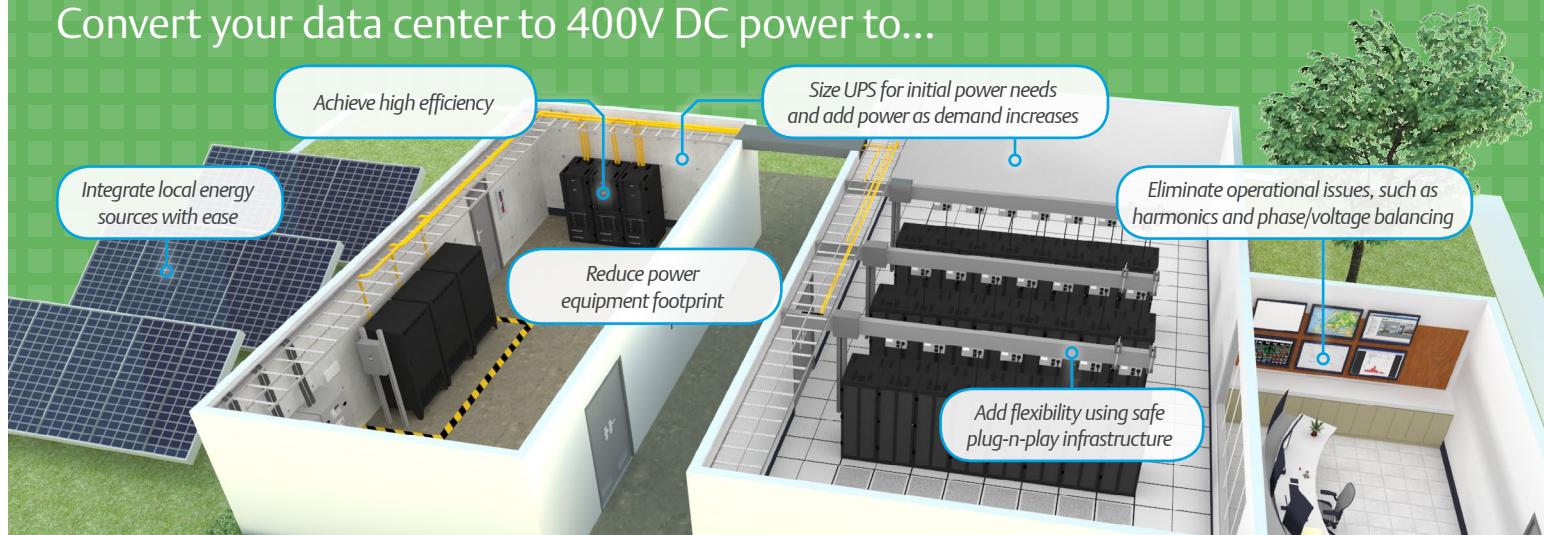


NetSure™ 721 with 400V DC Input

With the NetSure 721 400V to 48V DC-DC converter system, 400V DC power can be converted to 48V DC near the equipment loads. This lets you use existing 48V DC equipment loads while gaining the copper-saving benefit of 400V DC power for the main distribution.



Convert your data center to 400V DC power to...



400V DC Power Solutions for Data Centers

Data Centers

In data centers, 400V DC power solutions simplify the power chain by delivering DC power directly to servers and other electronic devices that consume DC power. By reducing conversions between AC and DC power, 400V DC solutions can streamline infrastructure footprint, increase availability, and improve efficiency.

Minimize Conversion Stages & Save Valuable Floor Space

The NetSure 9500 400V DC power system converts AC power to 400V DC power, in order to power IT equipment that inherently consumes DC power. By distributing 400V DC power to IT equipment, you can eliminate excess conversions between AC and DC [Figures 2 & 3]. The result is a more streamlined power architecture with high efficiency, smaller footprint, and high availability. With DC power, operational issues, such as harmonics and phase/voltage balancing, are eliminated. Local energy generation and storage are easy to integrate on a common DC bus.

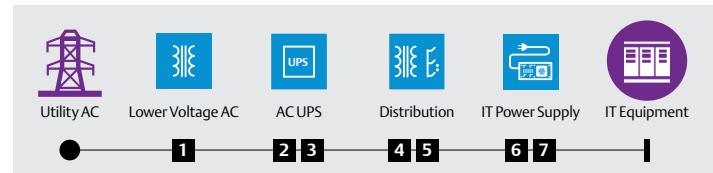


Figure 2. Traditional data center AC to DC conversion stages.

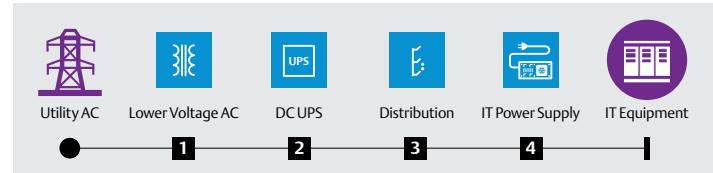


Figure 3. 400V DC data center AC to DC conversion stages.

Plug-n-Play Distribution

400V DC solutions can be implemented as part of a flexible, plug-n-play architecture. By using 400V DC rated busway and connectors, just like with AC power distribution, you can achieve highly adaptable and safe power distribution.



Energy Storage

A matching battery cabinet for short duration run times is specifically designed for use with the NetSure 9500 Series. Customized battery cabinets can also be connected to the NetSure 9500 system.



Scalable Architecture

The NetSure 9500 is scalable up to 600kW on a single bus to support a wide range of site sizes. The 15kW, hot-swappable rectifier building block enables the use of internal redundancy in the power system and allows power capacity to closely match site needs.





Global Resources with Local Knowledge

Emerson's service expertise and project management capabilities make data center and telecom site planning and deployment easy. We have the resources to service your facility anywhere, anytime. We are available 24/7/365 to support your site needs.

Project Services

Simplifying Installation

Emerson Network Power's Services team takes a holistic approach to your network to make sure that every facet of your infrastructure is rapidly deployed and operating at maximum efficiency from day one. We offer a full portfolio of essential services, from site survey to hand over of the site, all managed through a single interface thanks to regional project management teams.

Performance Services

Improving Availability, OpEx and CapEx

By leveraging our in-house knowledge of DC power, inverters, batteries, generators, thermal management, UPS, alternative and other energy sources, we pay attention to the entire system and help keep your network reliable in even the most challenging environments.

Maintenance Services

Preventive Maintenance

Keeping your equipment at best possible status requires regular maintenance. Emerson Network Power can serve as the single point of contact for all your maintenance needs. We understand your unique challenges and will tailor a service agreement that meets or exceeds your requirements. Complete documentation is provided following each maintenance visit. Reports provide a clear picture of system status and recommendations of corrective steps to prevent future problems.

Emerson Network Power's 400V DC power technology can solve your data center and telecom core site problems, helping you simplify your site, reduce costs, and achieve exceptional availability. Whether you are building a new site or upgrading an existing one, Emerson Network Power can optimize your power architecture to meet the challenges of rapidly evolving networks.

EmersonNetworkPower.com/EnergySystems

EmersonNetworkPower.com/400VDC

© Emerson Network Power, Energy Systems, North America, Inc. 2015.

Business-Critical Continuity™, Emerson Network Power™, the Emerson Network Power logo, Emerson™ and Consider it Solved are service marks and trademarks of Emerson Electric Co. EnergyMaster™, eSure™, NetPerform™, NetReach™, NetSpan™, NetSure™ and NetXtend™ are trademarks of Emerson Network Power, Energy Systems, North America, Inc. Any other product, brand, or company names or logos are the property of the respective owner.

While every precaution has been taken to ensure accuracy and completeness herein, Emerson Electric Co. assumes no responsibility, and disclaims all liability, for damages resulting from use of this information or for any errors or omissions. Specifications subject to change without notice.

EMERSON. CONSIDER IT SOLVED.™