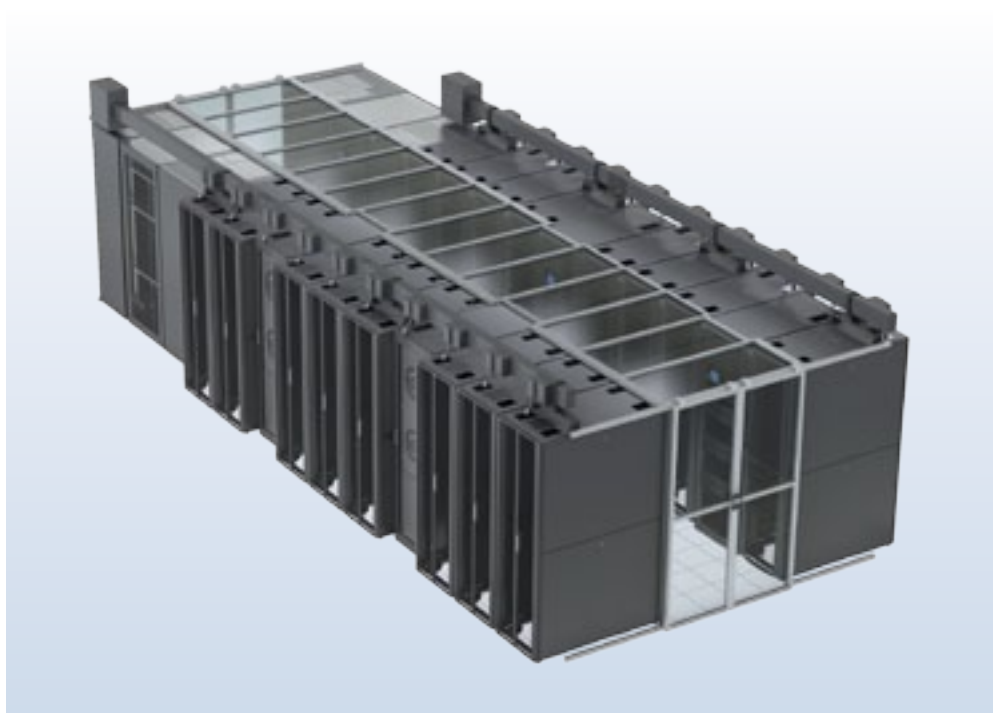


## *SmartAisle™*

Intelligent, Integrated Infrastructure for the Data Center



## Deploy An Efficient and Flexible Row-Based Infrastructure

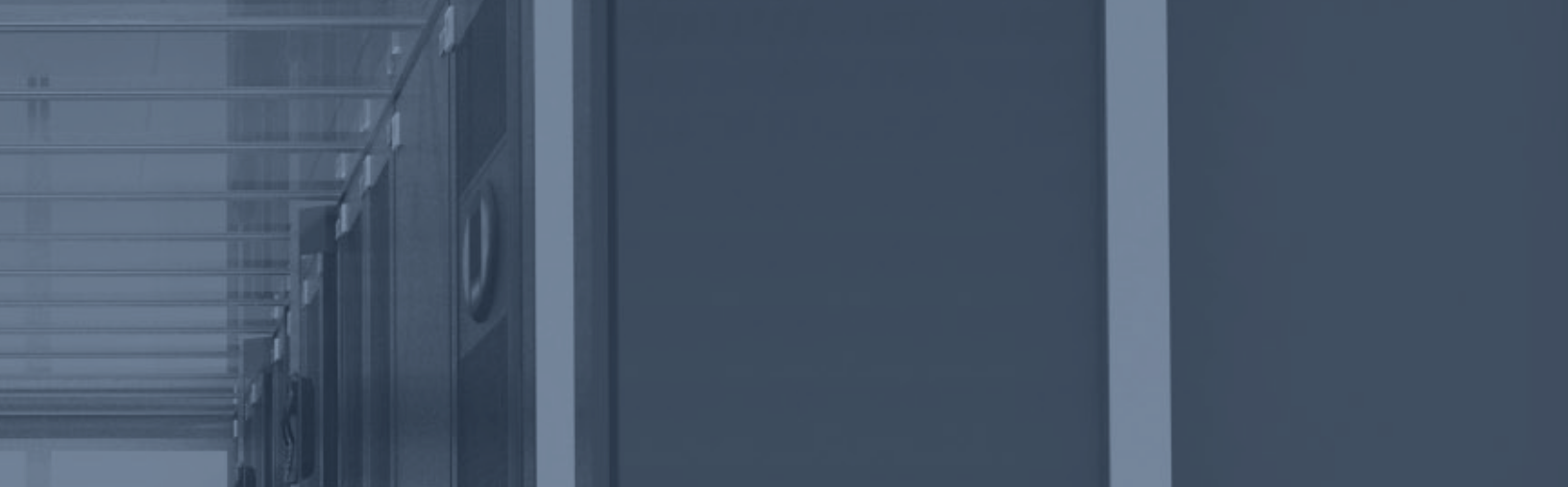
### Efficiency. Capacity. Availability. Control.

The SmartAisle™ infrastructure from Emerson Network Power offers considerable savings in CAPEX and OPEX via an intelligent, integrated row-based system. The infrastructure integrates racks, power, cooling and infrastructure management into a holistic data center solution.

With this solution, Emerson Network Power has demonstrated CAPEX savings of 10 percent AND OPEX savings of 27%, as well as:

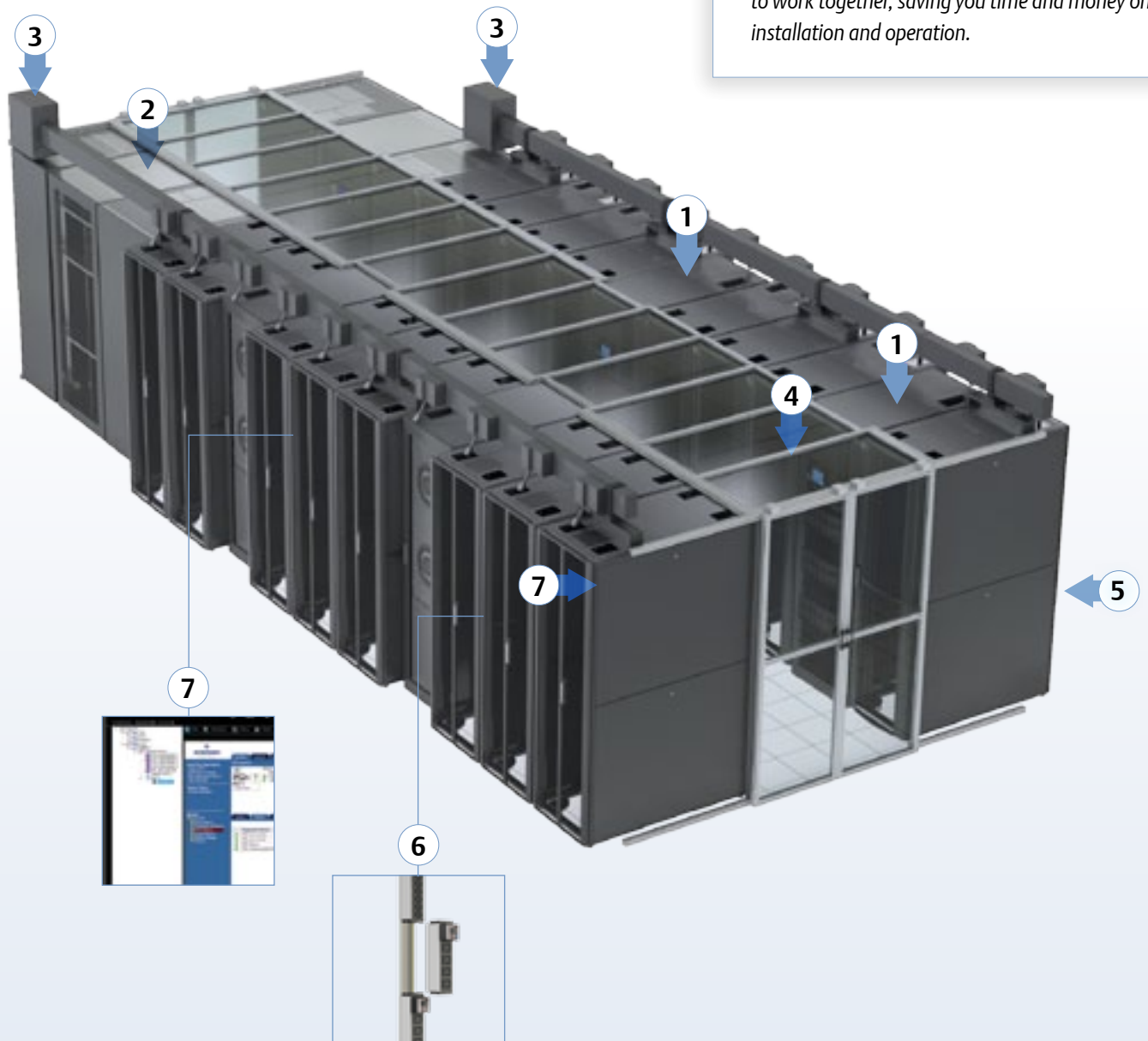
- Simplified, rapid deployment that means that installation doesn't hinder productivity or break budgets
- Enhanced cooling efficiency with the Liebert® CRV™ row-based precision cooling system, Liebert iCOM® Controls and cold aisle containment – combining to deliver PUEs 15-25% lower on average than that of a conventionally designed data center with the same capacity
- Industry's highest efficiency UPS and power management systems with modular designs for easier scalability
- Comprehensive visibility, insight and control via data center infrastructure management technologies ensure availability and efficiency when you need them most

- 1 High-efficiency precision cooling technologies and environmental controls**  
– Liebert CRV precision cooling system with Liebert iCOM controls matches cooling to rack load, and reduces cooling system energy consumption through:
  - Digital scroll compressor
  - EC plug fans
  - Teamwork control modes
- 2 Modular, scalable high-efficiency power**  
– Liebert APM™ UPS provides reliable, transformer-free, on-line, uninterrupted power, and KIRK® key interlock system for safety
- 3 Flexible power distribution** – Liebert MB™ Modular Busway is a flexible and more economical way to deliver power to the rack without the cost and hassle of power cable whips. It connects directly to rack PDUs
- 4 Cold Aisle Containment** – inexpensively supports capacity increases by separating hot and cold air for increased efficiency
- 5 Flexible platform for easy configuration** – Full-depth DCF™ racks maximize space utilization and allow you add any type of IT or networking equipment and simplify cable management with tool-less accessories
- 6 Flexible rack PDUs** – Liebert MPX™ adaptive rack PDU or Liebert MPH™ managed rack PDU provide flexibility and power control at the receptacle level, and faster implementation of IT equipment
- 7 Comprehensive, remote data center infrastructure management** – Avocent® appliances and software and Liebert Nform™ and Liebert SiteScan™ softwares provide comprehensive, remote monitoring and control



## SmartAisle™

Simple, fully integrated infrastructure – racks, precision cooling, monitoring, cable management and power systems are designed to work together, saving you time and money on installation and operation.



## What Makes the SmartAisle™ Offering Unique?

Imagine the advantages of an intelligent, integrated infrastructure with all the capabilities you need to achieve your IT objectives.

**The SmartAisle infrastructure utilizes these data center design and technology best practices to deliver the following results:**

1. Maximizes the return temperature at the cooling units to improve capacity and efficiency
2. Matches cooling capacity with IT load
3. Utilizes cooling design that reduces energy consumption
4. Uses power management systems that optimize availability and efficiency
5. Features a design that enhances flexibility using scalable architectures that minimize footprint
6. Utilizes real-time infrastructure optimization to provision resources faster, increase efficiency and reduce stranded capacity
7. Leverages the availability of in-market data center design expertise and technical assistance

### *Efficient*

- **Reduce energy consumption** up to 27% compared to conventional data center design through the use of Cold Aisle Containment, Liebert® precision cooling systems, and Liebert iCOM® controls
- **Increase availability** by using high-efficiency power systems, such as Liebert APM™ UPS or Liebert GXT3™
- **Improve productivity** and standardize equipment moves, adds and changes with monitoring and management technologies
- **Flexibly and cost-effectively distribute power** to the rack using Liebert MB™ Modular Busway, compared to using a distribution cabinet.

### *Economical*

- **Achieve equipment cost savings** and extend your existing infrastructure investment by using more efficient designs and technologies
- **Save up to 10% in capital expenditures** using technologies that help you avoid expensive room upgrades to cooling systems, flooring and power management

### *Simplified*

- **Simplify design, implementation and reconfiguration** using standardized, integrated systems
- **Ensure continuity** of business operations with single system startup, warranty, preventive maintenance and repair
- **Utilize industry-leading service and support** provided by local data center design experts

### *Controllable*

- **Free up stranded capacity** and gain efficiencies using Avocent® Data Center Planner™ and Liebert SiteScan™ software
- **Maintain cooling equipment operating levels** to ensure efficiency and availability, using Liebert iCOM controls
- **Monitor and manage power capacity** within the rack, by using Liebert UPS systems and rack PDUs

## Where to Use SmartAisle™ Infrastructure Solutions

### No Other Solution Offers the Industry's Leading Infrastructure Systems for Such a Wide Array of Applications and Environments

SmartAisle configurations can be scaled to fit any size IT environment from a row of racks to large enterprise data centers. The SmartAisle offering brings together the widest range of innovative infrastructure technologies such as modular row-based UPS, configurable PDUs, modular busway, data center infrastructure management software and the industry's leading precision cooling technologies.

The SmartAisle approach can be used as a standalone solution to scale from just a few racks up to an entire data center (most cost effective up to 400kW total load), with integrated row-based power, precision cooling and infrastructure management. Or within a larger data center, it can be applied to meet capacity growth objectives, providing the infrastructure support needed to increase density without increasing footprint.

This highly efficient, flexible and easily implemented solution can be deployed in either raised floor or non-raised floor environments.



A. JAMES CLARK  
SCHOOL OF ENGINEERING

*"Emerson Network Power was able to help the University of Maryland achieve Efficiency Without Compromise in revamping a 25-year-old data center into a modern infrastructure that is very efficient and will meet our growing capacity needs for the future."*

**—Jim Zahniser**, Executive Director of Information Technology, A. James Clark School of Engineering at the University of Maryland <sup>1</sup>

1 A. James Clark School of Engineering at the University of Maryland Case Study. CH-00022 (05/11).

### A. James Clark School of Engineering at the University of Maryland

**Location:** College Park, Maryland, USA.

**Critical Need:** Optimize an existing data center infrastructure for efficiency, availability and space-utilization to promote availability and accommodate future IT growth.

#### Products/Services:

- Comprehensive Thermal Assessment with Computational Fluid Dynamics (CFD) Modeling
- SmartAisle technologies, including Liebert CRV™ Row-Based Precision Cooling Solution with Liebert iCOM® Controls and remote monitoring facilitated by Liebert's Virtual Ntegrity Gateway (VNG)

#### Results

- Doubled cooling capacity and physical capacity of data center
- Optimized server configuration and airflow for maximum efficiency and IT availability
- Improved Power Usage Effectiveness (PUE) by 5.5 percent

## Economy and Efficiency

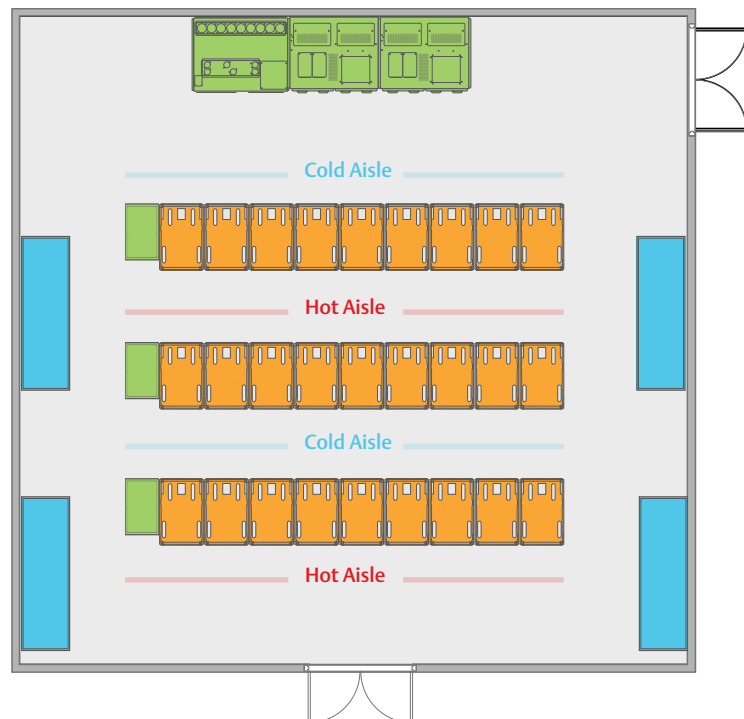
### Compare the Costs of a Conventional Data Center Design Versus the SmartAisle Infrastructure Solution

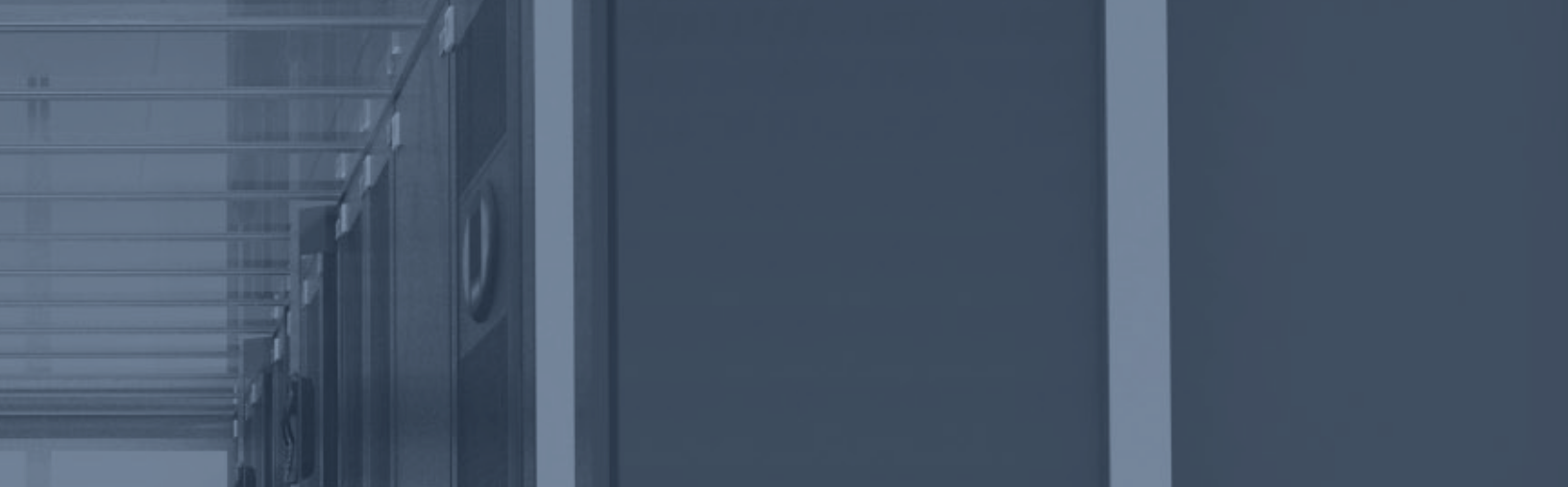
	Conventional Data Center Design	SmartAisle Design	Cost Savings	Advantage SmartAisle
<b>Room Costs</b>	\$515,000	\$459,000	\$56,000	11%
<b>Infrastructure Costs</b>	\$415,000	\$391,000	\$24,000	6%
<b>Total Capital Expense</b>	\$930,000	\$850,000	\$80,000	9%
<b>Energy Consumption</b>	\$63,600	\$46,500	\$17,000	27%
<b>5 Year OpEx</b>	\$318,000	\$233,000	\$85,000	27%
<b>5 Year TCO</b>	\$1,248,000	\$1,083,000	\$165,000	13%

#### Conventional

<b>Racks</b>	27
<b>Density</b>	5.9 kW per rack
<b>Total IT Load</b>	160 kW
<b>Cooling Units</b>	4 x 20 ton Precision Cooling systems Units
<b>Power</b>	2 x 100 kVA room-level UPS systems and power distribution

- Precision Cooling
- AC Power
- Racks and Integrated Cabinets





### Liebert® CRV™ Row-based Cooling, 20-40kW

Ideally suited and designed for cooling server rack cabinets in small and medium data centers. Features Liebert iCOM® controls, variable speed EC fans and a digital scroll compressor, for high reliability and energy efficiency.



### DCF™ Optimized Racks

19" data center rack system from Emerson Network Power integrates computing hardware, power management technologies and peripherals. It provides superior design flexibility, with optimized thermal and cable management features, and tool-less accessories.



### Liebert APM™ On-line UPS, 15-90kW

This row-based, transformer-free, on-line UPS allows quick and easy capacity increases with FlexPower™ hardware assemblies - no additional floorspace required. The UPS operates with the industry's highest efficiency - up to 94% at loads of 50-100%.



### Liebert MB™ Modular Busway

Provides high density power distribution to the rack while eliminating cable clutter that can reduce airflow. This modular system is easy to install, and is easily expanded with a variety components in configurations to meet unique site needs.



### Aisle Containment Systems

Separates hot and cold air streams for better cooling operation and higher efficiency. Doors and ceilings in Modular, Vertical and Retractable systems contain data center racks and IT equipment.



### Liebert MPX™ and Liebert MPH™ Rack PDUs

Adaptive and managed rack power distribution units allow remote monitoring and control at the receptacle level, as well as monitoring of environmental input options such as rack temperature and humidity. Rugged construction and industry's leading operating temperatures.

## SmartAisle

<b>Racks</b>	16
<b>Density</b>	10kW per rack
<b>Total IT Load</b>	160 kW
<b>Cooling Units</b>	6 row-based precision cooling units Cold Aisle Containment
<b>Power</b>	2 row-based UPS systems Modular power busway



Emerson Network Power, a business of Emerson (NYSE:EMR), delivers software, hardware and services that maximize availability, capacity and efficiency for data centers, healthcare and industrial facilities. A trusted industry leader in smart infrastructure technologies, Emerson Network Power provides innovative data center infrastructure management solutions that bridge the gap between IT and facility management and deliver efficiency and uncompromised availability regardless of capacity demands. Our solutions are supported globally by local Emerson Network Power service technicians. Learn more about Emerson Network Power products and services at [www.EmersonNetworkPower.com](http://www.EmersonNetworkPower.com)

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