SmartAisle™
Data Center Efficiency Management Platform

EMERSON™
Network Power

SmartAisle™
Data Center Efficiency Management Platform

Reduce energy consumption while supporting higher density IT and networking equipment — without compromising your requirement for availability.

SmartAisle, from Emerson Network Power, is a platform of technologies designed to optimize the efficient, design and operation of your data center infrastructure.
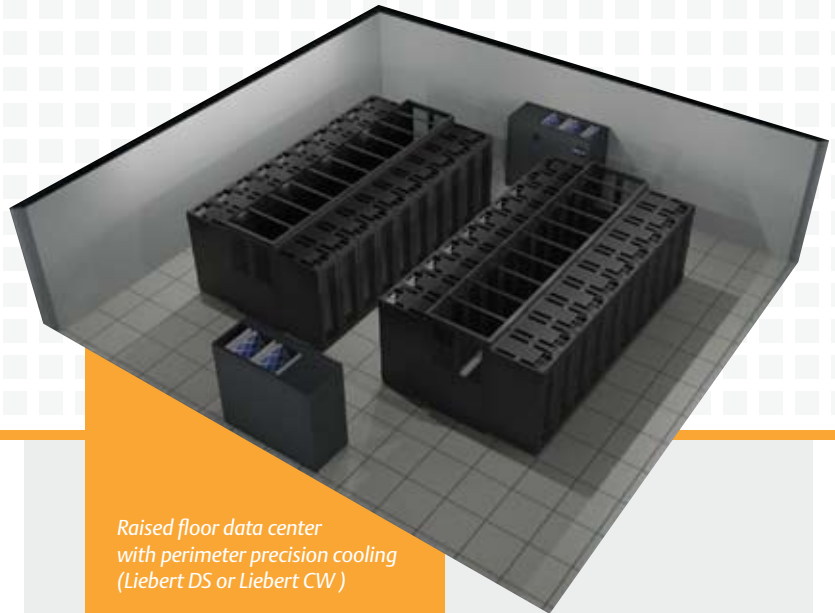
SmartAisle is Ideally Suited For:
- Hot aisle/cold aisle applications
- Raised floor data centers with perimeter cooling
- Non-raised floor data centers using row-based precision cooling systems such as Liebert CRV or Liebert XD
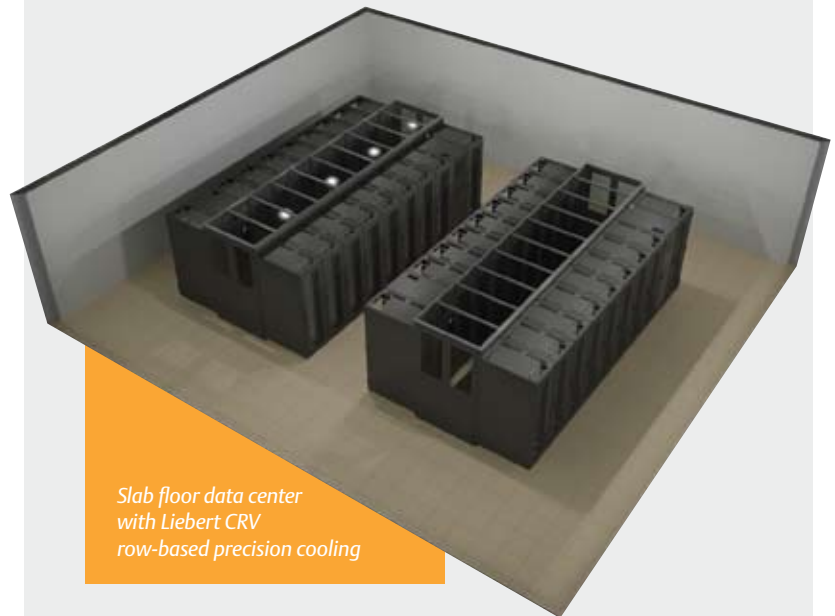- Retrofit to existing racks

Configure SmartAisle to maximize energy efficiency and system availability:
- Liebert iCOM control
- Temperature and Airflow sensors
- Knurr DCM cabinets
- Plexiglass roof panel system / containment curtain
- Sealed entry doors
- Liebert Precision Cooling systems
- Roof-mounted wiring module

Slab floor data center with Liebert CRV row-based precision cooling

SmartAisle may be installed at any location in the data center with multiple rack configurations. Shown with containment curtain.

Problem

In the thermo graphic view of a typical data center, the problem with the traditional approach in high density data centers is highlighted by the numerous hot spots and wide variation in inlet temperatures to the IT equipment.
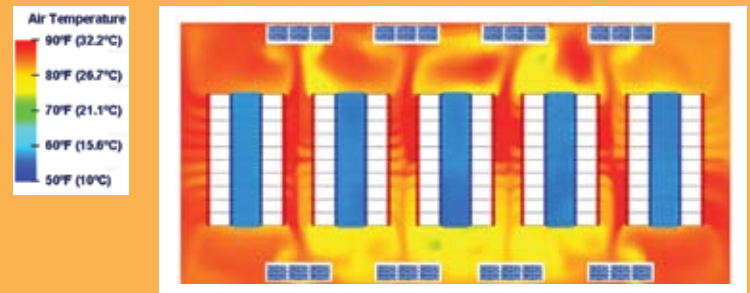
Typical Data Center (top view)

Hot Spot
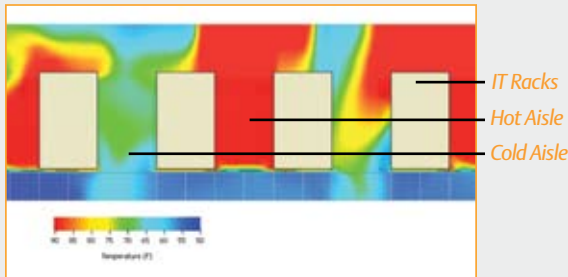IT Racks
Perimiter Cooling Units
Hot Aisle
Cold Aisle
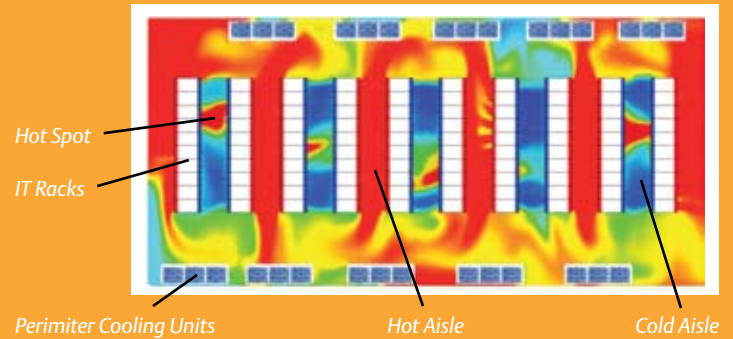
Solution:

The heart of the SmartAisle system is the unique Liebert iCOM control system which dynamically optimizes the operating parameters of your precision cooling environment.
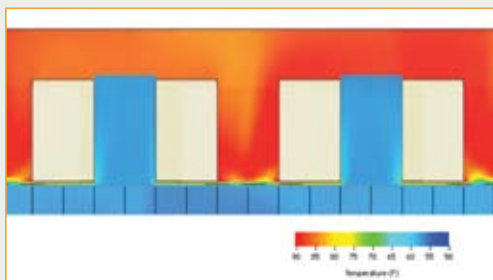
SmartAisle Data Center (top view)

Air Temperature
90°F (32.2°C)
80°F (26.7°C)
70°F (21.1°C)
60°F (15.6°C)
50°F (10°C)

Typical Data Center (end of row view)

IT Racks
Hot Aisle
Cold Aisle

Without aisle containment, hot and cold air mix in both the hot and cold aisles, making the cooling system less effective and less energy efficient.

SmartAisle Data Center (end of row view)

With SmartAisle, uniform temperature ensures effective cooling, and provides consistently hot return air for more effective precision cooling system performance.

SmartAisle is Designed to:

Optimize Cooling System Efficiency
- 30+% efficiency increase
- Continuous dynamic adaptation to load
- Less fan power per kW cooling

Eliminate Hot/Cold Air Mixing
- Uniform and predictable temperature to all IT equipment
- Integrate the cooling unit air flow delivery with the IT equipment requirements

Increase Space Efficiency
- 30+% increase in IT equipment density
- Up to 12kW/rack with perimeter cooling
- Up to 30kW/rack with localized cooling

Increase Capacity
- 25+% increase in available cooling capacity
- Extend capacity of existing precision cooling system

Allow Easy Retrofit
- In many cases, no requirement to replace existing raised floor cooling infrastructure
- Components fit through standard doorways
- Fits existing Knurr racks

Leverage Redundancy/Availability
- Utilize existing cooling redundancy of raised floor air distribution and high availability cooling infrastructure
- Retrofit existing racks with SmartAisle

Provide Fast Return on Investment (ROI)
- Payback within a few months to less than 2 years
- Low initial investment

Liebert iCOM Large Graphic Display

Liebert iCOM Controls: the Key to Operational Reliability and Energy Efficiency

Liebert ICOM

The Liebert iCOM control system featured on Liebert Precision Cooling products brings high-level supervision to multiple units, allowing up to 32 cooling units to work together as a single system to optimize room performance. Liebert iCOM controls offer a variety of advantages, including increased system energy efficiency, availability and flexibility.

Teamwork Configuration

Unit-to-unit network established

With SmartAisle operation, the precision cooling units work together to provide matched airflow, delivering the optimal air volume and temperature for the enclosed space.

Control:

- **Controls cooling and humidity** to optimize environment – provides dew point control for cooling efficiency

- **Manages data center "zones"** to optimize cooling – establish zones for non-homogeneous heat loads, contained areas, and localized high density areas

- **Ensures continuous operation with auto-changeover to standby unit in case of primary unit shutdown** – no additional equipment is required for lead/lag units

Benefits :

- **Maintain optimum temperatures** at inlet of IT equipment

- Dynamic fan speed and cooling capacity control for **maximum cooling efficiency**

- Allows cooling units to work in teamwork mode for **energy efficient load sharing operation**

- Manages data center "zones" including non-homogeneous heat loads, contained areas, and localized high density areas for **optimized cooling performance**

- Increased availability with automatic changeover control for **redundant operation**
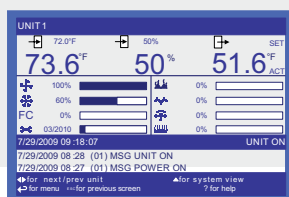
Monitoring:

- **Displays detailed, real-time information** to keep you informed of unit performance – includes current cooling and humidification status, setpoints, current and recent alarms, and component health

- **On-unit or central screens** available with the level of support required for the protected space

- **Compatible with centralized monitoring and control platforms** – Liebert IntelliSlot Web or 485 cards enable monitoring through Liebert SiteScan, Building Management System, SNMP or HTTP
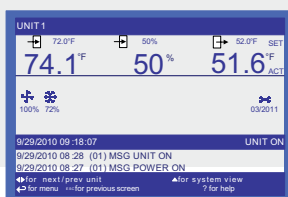
Predictive Wellness/ Maintenance:

- Enhances reliability with predictive analysis of components and performance – advance notice allows proactive management of system maintenance

- Event logs store the last 400 messages to enrich unit history and enhance support

Service and Spare Parts History:

- On-board service history allows prompt access to records for service personnel

- On-board spare parts list provides convenient identification of the appropriate unit spare parts and part numbers for faster service and support

Graphical view of home screen provides at-a-glance status of the cooling system.

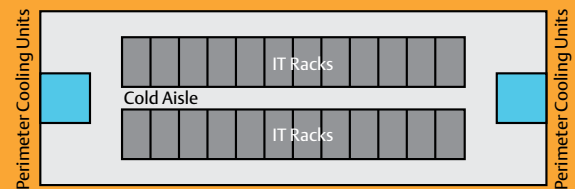*Simple view of home screen offers an alternate status view.*

Service menus offer a logical guided experience for maintenance personnel.

Measurable Energy Efficiency

Traditional Operation

75˚F
89˚F
54˚F
70˚F
54˚F
IT Racks
IT Racks
100% Fan Speed
Precision Cooling

With Cold Aisle Containment

85˚F
94˚F
62˚F
80˚F
62˚F
IT Racks
IT Racks
90% Fan Speed
Precision Cooling
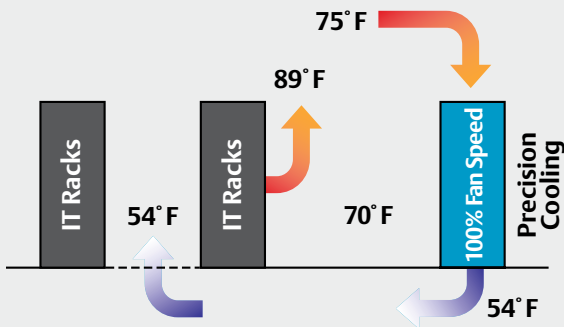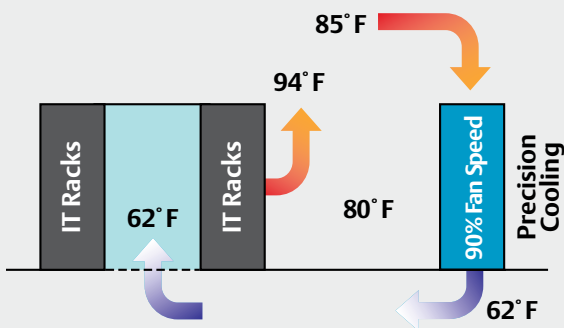
SmartAisle with Integrated Containment

Liebert iCOM

92˚F
97˚F
62˚F
85˚F
62˚F
IT Racks
IT Racks
67% Fan Speed
Precision Cooling
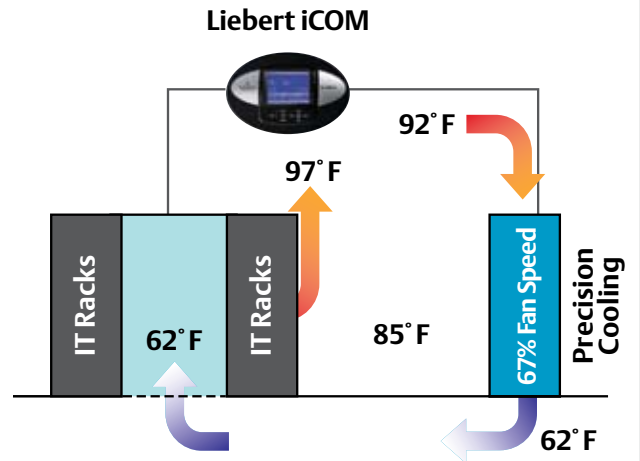
- Requires less fan power per kW of cooling
- Leverages variable fan speed control
- Operates with digital scroll technology for variable capacity control
- Provides continuous dynamic adaptation to cooling load
- Allows you to easily take advantage of free cooling designs
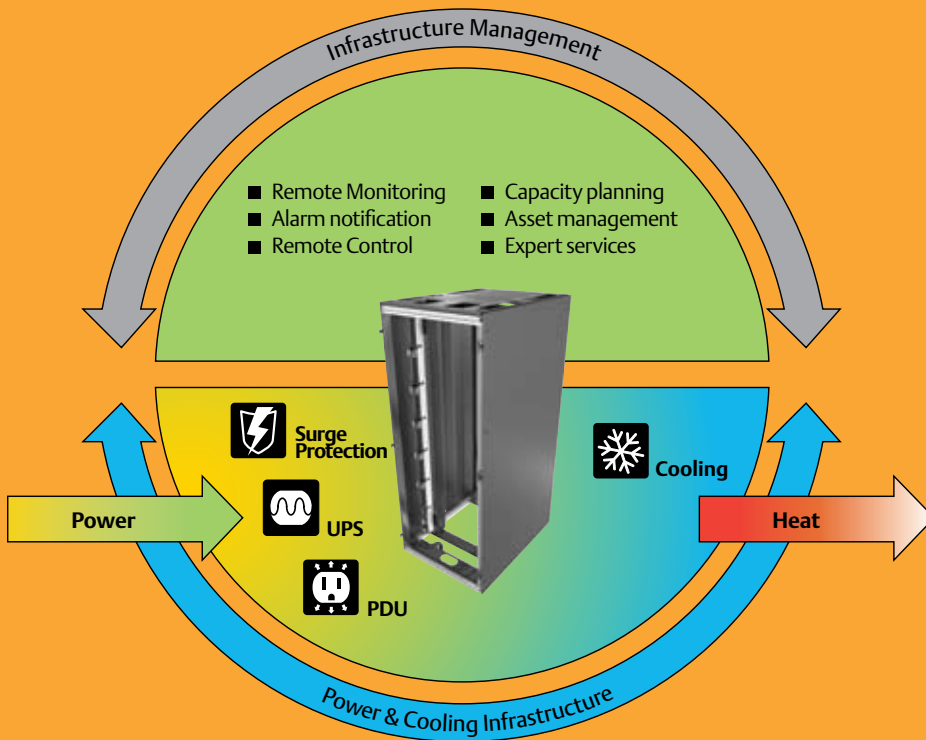
Savings - Direct Expansion System

	Traditional Approach	With Cold Aisle Containment	With SmartAisle
Compressor	69.7%	50.9%	50.4%
Condensor	9.3%	9.3%	9.3%
Evaporator Fan	21.0%	18.5%	7.2%
Total	100%	78.7%	66.9%
Savings		**21%**	**33%**

Savings - Chilled Water System

	Traditional Approach	With Cold Aisle Containment	With SmartAisle
Chiller*	71.3%	64.9%	60%
Pumps*	10.0%	5.4%	5.2%
Air Handler Fan	18.7%	14.3%	7.2%
Total	100%	84.6%	72.4%
Savings		**15%**	**28%**

* Estimated savings based on dedicated data center chiller

Enhanced Performance
and Management of Dynamic IT Spaces

Infrastructure Management

- ■ Remote Monitoring
- ■ Alarm notification
- ■ Remote Control
- ■ Capacity planning
- ■ Asset management
- ■ Expert services

Surge Protection

Cooling

UPS

Power

Heat

PDU

Power & Cooling Infrastructure

Today's successful businesses depend on adaptable technologies to help them respond quickly to market demands. Your data center must be built on a support infrastructure designed to match the power and cooling needs of rapidly changing IT initiatives such as virtualization and consolidation. Each IT change, move or addition will affect the entire support infrastructure—you need products and support that ensure your IT systems will operate reliably in these environments.

IT Racks and Accessories

Knurr IT Rack
- ■ Industry leading 83% perforation for high density IT equipment
- ■ Dozens of simple tool-less accessories
- ■ Significant zero-U mounting space
- ■ Roof designed for optional high density cooling

Knurr Aisle Containment
- ■ Flexible design independent from rack width
- ■ Swinging or sliding doors
- ■ Overhead panels
- ■ Containment curtains
- ■ Integrated adaptive control reduces fan energy cost
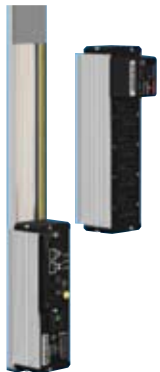
Liebert and Knurr Rack PDU
- ■ Basic, controlled or adaptive designs
- ■ Local and remote monitoring
- ■ Additional in-rack sensors available
- ■ Available in low and high density
- ■ 2-year no-hassle replacement warranty

Liebert Busway
- ■ Tool-less mounting to Knurr racks
- ■ Plug-n-play bus plug / rack PDU connections
- ■ Replaces multiple power cables
- ■ Available in dual bus design

Power and UPS

Liebert NX UPS
- Scalable capacity growth without increasing footprint
- Parallel configurations for capacity or redundancy
- Operates with up to 97% energy efficiency
- In-the-row installation
- Liebert Services – industry's largest network of service and support

Liebert FDC/Liebert FPC
- Rack-size power conditioning and distribution
- Requires only front and back service access
- Offers top or bottom cable entry
- Liebert Services – industry's largest network of service and support

Precision Cooling

Liebert CRV
- 20kW to 40kW precision cooling with horizontal airflow design for both non-raised and raised floors
- Digital scroll compressor and variable speed fans for highly efficient operation
- Air, water, glycol and chilled water designs
- Liebert iCOM for intelligent control, communications and monitoring

Liebert DS
- Industry standard in floor mount precision cooling.
- Available in single units from 28kW to 105kW
- Flexibility of design with air, water, glycol and GLYCOOL cooling
- Liebert iCOM for intelligent control, communications and monitoring
- Digital scroll technology for variable capacity control
- Widest variety of air supply configurations

Liebert XD
- High heat density cooling system that requires little to no data center footprint
- Additional energy savings with pumped refrigerant technology
- Intelligent fan control in each module and Liebert iCOM for intelligent control, communications and monitoring
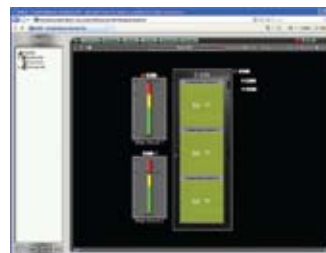
Liebert CW
- Chilled Water cooling
- Available in single units from 26kW to 181kW
- Optional EC Plug Fans maximize energy efficient operation
- Liebert iCOM for intelligent control, communications and monitoring
- Widest variety of air supply configurations

Infrastructure Management

Liebert Nform
- Software solution providing centralized monitoring of a wide range of data center infrastructure equipment
- Leverages existing network communications
- Triggers event actions or notifications

Liebert SiteScan Web
- Software solution providing centralized monitoring of a wide range of data center infrastructure equipment
- Leverages existing network communications
- Triggers event actions or notifications

Ensuring The High Availability Of
Mission-Critical Data And Applications.

Emerson Network Power, a business of Emerson (NYSE:EMR), is the global leader in enabling *Business- Critical Continuity*™ from grid to chip for telecommunication networks, data centers, health care and industrial facilities. Emerson Network Power provides innovative solutions and expertise in areas including AC and DC power and precision cooling systems, embedded computing and power, integrated racks and enclosures, power switching and controls, monitoring, and connectivity. All solutions are supported globally by local Emerson Network Power service technicians. Liebert AC power, precision cooling and monitoring products and services from Emerson Network Power deliver Efficiency Without Compromise™ by helping customers optimize their data center infrastructure to reduce costs and deliver high availability.

Emerson Network Power.
The global leader in enabling *Business-Critical Continuity*™.

■ AC Power	■ Embedded Computing	■ Outside Plant	**■ Racks & Integrated Cabinets**
■ Connectivity	■ Embedded Power	■ Power Switching & Controls	■ Services
■ DC Power	■ Monitoring	■ Precision Cooling	■ Surge Protection