Integrated Cabinet Solutions for Business-Critical Continuity™

## SmartAisle™

Data Center Efficiency Management Platform



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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 room 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 Rack cabinets
- KITUH KACK CADITIELS
- Plexiglass roof panel system / containment curtain
- Sealed entry doors
- Liebert Precision Cooling systems
- Roof-mounted wiring module

SmartAisle may be installed at any location in the data center with multiple rack configurations Shown with containment curtain Raised floor data center with room precision cooling (Liebert PEX )

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



### **Typical Data Center (top view)**

# 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.



#### SmartAisle Data Center (top view)



## 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.

## Typical Data Center (end of row view)



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 room 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 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.

#### **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 autochangeover 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



Service menus offer a logical guided experience for maintenance personnel.



Liebert iCOM Large Graphic Display

#### **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.

### 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

UNIT1 -0 72.07 -0 50% 74.1 <sup>7F</sup> 50 -100% 72%	
9/29/2010 09:18:07	UNIT ON
9/29/2010 08:28 (01) MSG UNIT O	N
9/29/2010 08:27 (01) MSG POWER	L ON
♦ for next/prev unit	▲forsystem view
♦ for menu *** for previous screen	?forhelp

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

Simple view of home screen offers an alternate status view.

# Measurable Energy Efficiency

### **Traditional Operation**



#### With Cold Aisle Containment



## **SmartAisle with Integrated Containment**



- 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%
Condenser	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



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



- 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 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 ITA**

- Scalable capacity growth without increasing footprint
- Supports parallel operation of up to 4 units that allows flexibility for capacity expansion
- Available in standard and long backup model capable of having 4-8 hours runtime
- Up to 0.9 pf, suitable for today's servers
- Compatible with single-phase and 3-phase input power (self-configure)



#### 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 PEX

- Industry standard in floor mount precision cooling.
- Digital Scroll Compressor for highest efficiency, low noise and variable capacity control
- EC Fans for increased unit efficiency and lower operating costs
- Flexibility of design with air, water, glycol and GLYCOOL cooling
- Liebert iCOM for intelligent control, communications and monitoring
- High kW to footprint ratio (18% more kW per square meter compared to industry average)
   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

## 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.

#### About Emerson Network Power

Emerson Network Power, a business of Emerson (NYSE:EMR), is the world's leading provider of critical infrastructure technologies and life cycle services for information and communications technology systems. With an expansive portfolio of intelligent, rapidly deployable hardware and software solutions for power, thermal and infrastructure management, Emerson Network Power enables efficient, highly-available networks.

Learn more at www.EmersonNetworkPower.Asia.

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