Liebert®

iCOM™ Thermal System Controls

Greater Data Center Protection, Efficiency & Insight

All for One, One for All

Optimize a Single Cooling Unit With an Intelligent Control and Good Things Happen.

Integrate multiple cooling units into an intelligent system, all working toward one goal, and even better things happen. **Such as a 50% reduction in energy consumption.**

And when they're controllable from one pane of glass? Data center managers get the comprehensive thermal management tools they need to meet the high expectations being placed on their environments.

Introducing the New Era of Environmental Control

The all-new Liebert® iCOM™ thermal controls offer thermal management optimization at both the unit and system levels, with easy-to-use, touch screen interfaces that give data center managers the insight needed to maximize performance.

At the cooling unit level, the Liebert iCOM unit control provides the highest protection available and optimal performance.

- Monitors 380 unit and component points to eliminate single points of failure

- Self-healing features avoid passing unsafe operating thresholds

- Highly intuitive, full-color, touch screen simplifies operations to save time and reduce human error

- Multiple, automated unit protection routines, including lead/lag, cascade, rapid restart, refrigerant protection and valve calibration

At the supervisory level, the Liebert iCOM-S system control offers a revolutionary way to harmonize and optimize thermal system performance to optimize capacity across the data center, gain quick access to actionable data, and automate system diagnostics and trending.

- Advanced monitoring and at-a-glance reporting on performance metrics and trends for efficiency, capacity and adverse events

- Up to 50% system efficiency gains

- 30% lower deployment costs

- Teamwork modes that prevent conflict between units and allow them to adapt to changes in facility and IT demand to improve efficiency and availability and reduce system wear and tear – saving more than $10,000 per unit per year in energy costs

- Simple and easy to deploy — auto-configuration to detect and configure up to 4,800 sensors, eliminating the need for custom integration to building management systems and cutting sensor deployment times in half

Liebert iCOM unit control and Liebert iCOM-S system control are available for new Vertiv™ data center cooling units or as retrofits.

## Simplify Thermal System Management for Protection, Efficiency & Insight

	LIEBERT® iCOM™ UNIT CONTROL	LIEBERT iCOM-S SYSTEM CONTROL
Description	Mission critical unit control for greater protection	Supervisory, multi-unit mission critical control for higher efficiencY and insight
	Available on new Vertiv™ cooling units and backward compatible for retrofits	Direct Integration with Liebert iCOM unit controls, with U2U connection
	7" color, capacitive touchscreen	22" color, high-definition, capacitive touch screen display
	2 USB, 2 RS-485 and 2 Ethernet ports	48-port network switch - no monitoring cards required
		Integrated firewall/router
	LED and audible alarms	Integrated Wi-Fi/Ethernet
Protection and Insight	Highest unit protection available	Advanced monitoring and collaborative protection
	380 unit and component monitoring points	Efficiency, capacity and system performance monitoring, trending and planning
	Over 200 unit and component alarms	Visual floor plan thermal sensor map
	Redundant unit failsafe modes	High security mesh wireless sensor network
	Unit protection routines – lead/lag, cascade	Adaptive control for hot spot reduction and self-healing
	Fast restart	
	Refrigerant protection	
	Automatic chilled water valve calibration	
Efficiency	10-20% unit efficiency gains	Up to 50% system efficiency gains
	Shared workload teamwork	Advanced machine-to-machine (M2M) teamwork with wireless sensor integration
	Collaborative, non-fighting teamwork	Independent airflow and temperature control with fan speed coordination
	Predictive auto-ecomomization	Group/Zone control to reduce temperature variations
	Dew point, rack sensor, supply air, return air or differential pressure control	Set point change coordination
Deployment	20% reduction in deployment time/costs compared to integration and mapping each cooling unit to a building management system	30% lower wireless sensor deployment costs through automatic sensor configuration
	Quick start wizard set up	Automatic sensor detect and configuration for up to 4800 sensors
	BMS points generator tool	Single connection point for all thermal equipment
	Single wire unit-to-unit connection	Integrated cable management and wall mounting bracket
	1-hour retrofit installation	Single person installation
	Exportable configuration parameters and event history	Desk or wall-mount applications

Unit Control: Greater Protection

Liebert® iCOM™ controls enhance cooling unit operation and improve data center availability by protecting units from damage, with automated routines for unit protection, fast restart, unit cascading and contaminant removal.

The unit control communicates alerts, auto-tunes key operating parameters, such as fan speed, compressor utilization and economization, and prevents cooling units from exceeding key thresholds.

Faster Restart


- 8 times faster
- Less rise in temperature
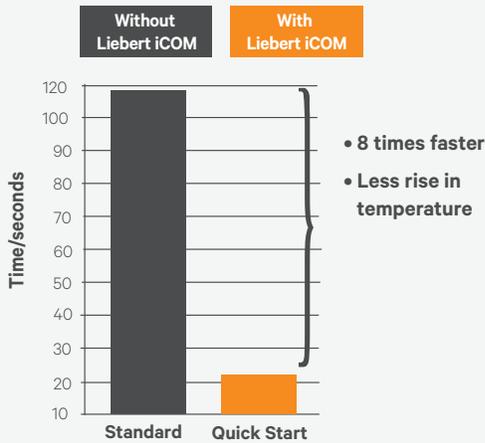
Recovery times from loss of power or transfer to generator power are reduced. Faster restart decreases temperature rise during these events.

Dynamic Thermal Response


Unit-to-Unit network established
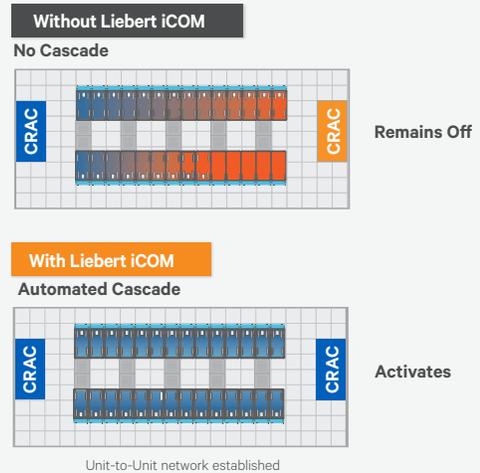
Automatic cascade and lead/lag routines activate and deactivate units based on room load to minimize hot spots and overheating.

Auto Valve Calibration
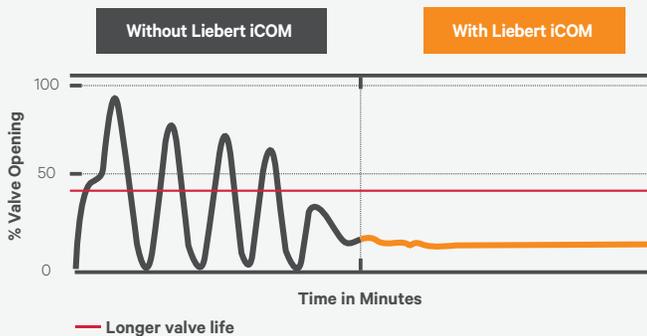
Automatic valve calibration and valve type detection increase valve life expectancy by only moving the valve in increments that actually result in a change of water flow. They eliminate valve backlash and valve gear wear.

Refrigerant Protection
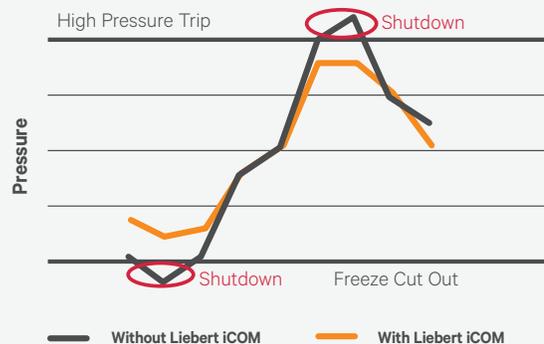
Self-healing routines prevent DX refrigerant freeze. As refrigerant pressure approaches thresholds, the controls lower fan speed and compressor capacity so cooling is not disabled due to a low-pressure cut out. At the other end of the spectrum, the controls adjust the compressor down and raise fan speed so cooling is not disabled due to a high pressure condition.

Unit Control: Enhanced Efficiency, Faster Deployment

Liebert® iCOM™ unit controls improve efficiency with machine-to-machine collaboration and automated routines that adjust cooling unit capacity to environmental conditions. They also require little or no customization, reducing the need for expensive integration into building management systems.

Energy Savings from Teamwork Mode

For a Single Unit	WITHOUT LIEBERT iCOM	WITH LIEBERT iCOM
% Conflicting Operations	30%	0%
Lost Hours	2,268	0
Cost @$0.10 /kWH	$10,406	$0

Data center cooling units operate in conflict (cool/reheat) about 30% of the time. Liebert iCOM unit controls come pre-configured with teamwork control modes that automatically adjust cooling unit operations to reduce conflicts and enhance efficiency and availability.

Automated Economizer Switch Over

	WITHOUT LIEBERT iCOM	WITH LIEBERT iCOM
Annual Economizer Hours	30%	0%
Additional Economizer Hours with Liebert iCOM	45% (1100 hours / year)	
Total $ Saving	$17,600 / year	

20 Units
8kW savings / unit during economization
10 Cents / kW

Economizer control routines automatically switch over to economization when the environment allows, increasing economization hours, eliminating the need for custom controls and removing human error.

Savings From Using Dewpoint Control
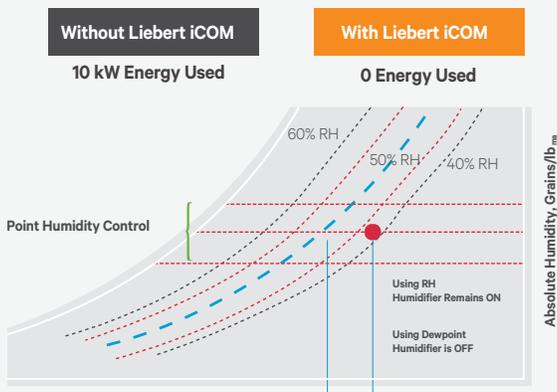
The dew point control routine operates humidification and dehumidification from dew point instead of relative humidity. This prevents activation of these components based on large temperature changes, thereby saving energy.

Reduce Deployment Costs

	Unit Control Programming	Site Control Programming	
Without Liebert iCOM (using custom controls)	$10,000	$40,000	
WITH LIEBERT iCOM (With Teamwork)	Ships pre-configured	$10,000	
SAVINGS with Liebert iCOM	$10,000	$30,000	$40,000 (or 80%)

Controls come pre-configured for unit-to-unit communications to reduce energy consumption and increase performance. Little or no customization is needed, unlike building management system applications, which require significant on-site programming.

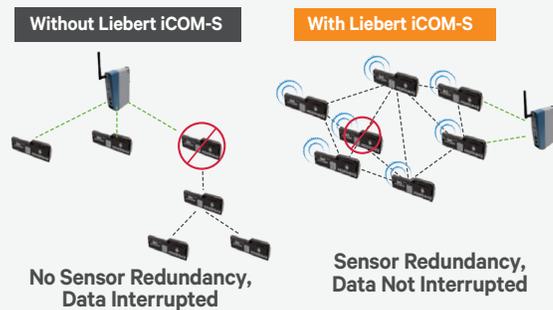## System Control: Greater Protection and Insight

Liebert® iCOM™-S system controls allow data centers to more easily reach and maintain the optimal balance point of matched cooling capacity and IT load. They accomplish this by monitoring the data center environment through wired or wireless sensors and controlling the operation of multiple cooling units through machine-to-machine communications. Failsafe routines automatically activate to protect against adverse events.

- Streamlined Connectivity

- Direct connections with cooling units and sensors gateways eliminating
  the possibility of third party systems interferring with unit operation, causing downtime.

Without Liebert iCOM-S

BMS — Wireless Control to Gateways & Sensors

With Liebert iCOM-S

BMS
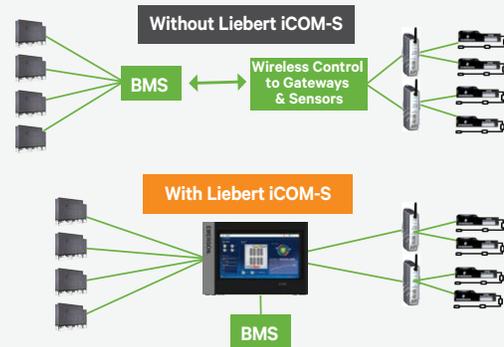
Wireless Sensor Mesh Protection

Secure sensor mesh eliminates single points of failure by providing automatic backup in the event a sensor fails.

Without Liebert iCOM-S   With Liebert iCOM-S

No Sensor Redundancy, Data Interrupted

Sensor Redundancy, Data Not Interrupted

Insight For Action

Liebert iCOM-S system controls gives unsurpassed visibility into thermal system operations.
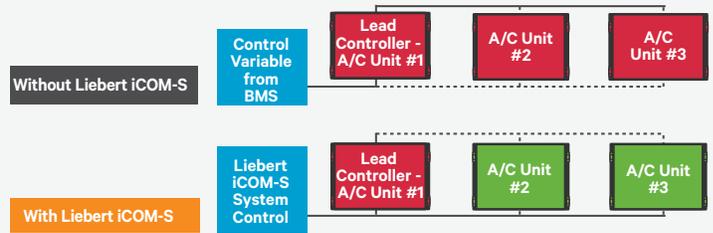
- High definition touch screen allows users to easily configure, monitor and enhance the data center cooling from a central location

- Visual thermal sensor map

- Alarm management displays allow users to quickly view event notifications and pinpoint problems

- Trending reports provides historical information for infrastructure planning and performance tracking

- Displays key metrics on data center environmental conditions and cooling unit performance and health

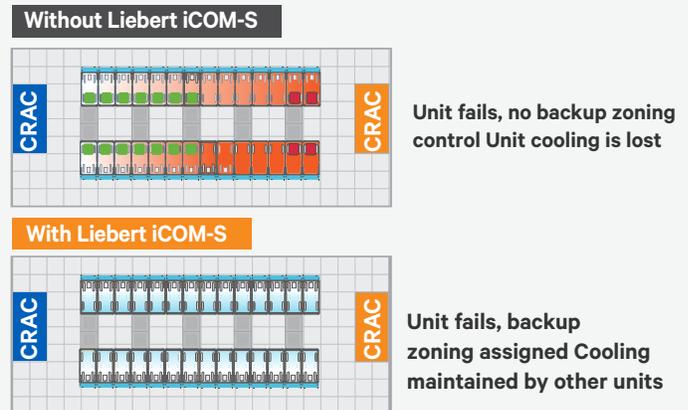# System Control: Greater Protection and Insight (cont'd)

Timeout and Failover Protection

Timeout and failover scenarios allow hand-shaking between cooling units and the system control. Fail-safe scenarios ensure data center uptime and reliability. Without Liebert iCOM-S controls in place, if a lead unit were to fail, then the other units relying upon it would also fail. With Liebert iCOM-S controls in place, the other units remain operating.

Without Liebert iCOM-S

| Control Variable from BMS | Lead Controller - A/C Unit #1 | A/C Unit #2 | A/C Unit #3 |

With Liebert iCOM-S

| Liebert iCOM-S System Control | Lead Controller - A/C Unit #1 | A/C Unit #2 | A/C Unit #3 |

Zone Backup Protection

Backup zoning control assigns primary and secondary areas of influence for each cooling unit in case units fail to maintain room service levels.

Without Liebert iCOM-S

Unit fails, no backup zoning control Unit cooling is lost

With Liebert iCOM-S

Unit fails, backup zoning assigned Cooling maintained by other units

System Control: Greater Efficiency, Faster Deployment

Liebert® iCOM™-S system controls harmonize and optimize thermal system performance across the data center, and provide quick access to actionable data, including system diagnostics and trending. Automated routines and machine-to-machine communications allow the system as a whole to adapt to changes in facility-level demand as efficiently as possible. Simplified configuration routines and functions speed deployment.

M2M Control for Energy Savings

Liebert iCOM-S controls decouple cooling components — compressors, chilled water valves and economizers — from fan operation, allowing them to operate independently. This matches airflow and temperature to changing IT load requirements and maximizes the efficiency of each component. Air is returned to the cooling units at a higher temperature resulting in higher efficiency.
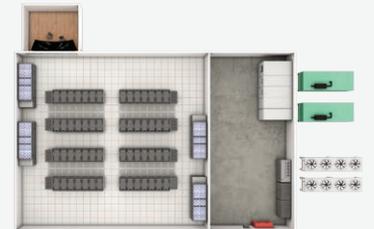

Without Liebert iCOM-S
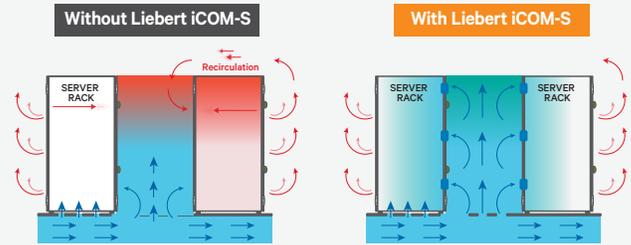
With Liebert iCOM-S

Quickly Import Floor Plans

Allows users to easily upload their data center floor plan and configure their thermal system.

Without Liebert iCOM-S

Build floor plan in vendor tool
More than 4 Hours

With Liebert iCOM-S

Import floor plan
Less than 30 Minutes

Capacity with IT Load

Liebert iCOM-S controls automatically adjust cooling units to match cooling unit capacities to the IT load, even at extreme low load conditions. Without Liebert iCOM-S controls, cooling units may overcool the data center, resulting in wasted energy.

* IT Required CFM = 20,000   * Min Unit Fan Speed = 50%

	WITHOUT LIEBERT iCOM-S	WITH LIEBERT iCOM-S
	Low Load	Low Load
Unit 1	50%	OFF
Unit 2	50%	50%
Unit 3	50%	OFF
Unit 4	50%	50%
Unit 5	50%	OFF
Energy	$6,681	$2,672
CFM	60,000	24,000

# System Control: Greater Efficiency, Faster Deployment (cont'd)

Fan Speed Coordination Delivers Air Based on IT Equipment Demand

Machine-to-machine communications and advanced algorithms coordinate fan speeds to achieve needed airflow at optimal efficiency.

	WITHOUT LIEBERT iCOM-S	WITH LIEBERT iCOM-S
Energy Savings		40%
Energy $ / Year	$18,255	$11,540
Unit 1 Fan Speed	30%	60%
Unit 2 Fan Speed	35%	60%
Unit 3 Fan Speed	75%	60%
Unit 4 Fan Speed	100%	60%
Unit 5 Fan Speed	60%	60%
Total CFM	122,000	122,000

Eliminate Excessive Sensor Wire Runs

Daisy chaining configuration for data center sensors significantly reduces the number of wire runs to the system control.

Without Liebert iCOM-S
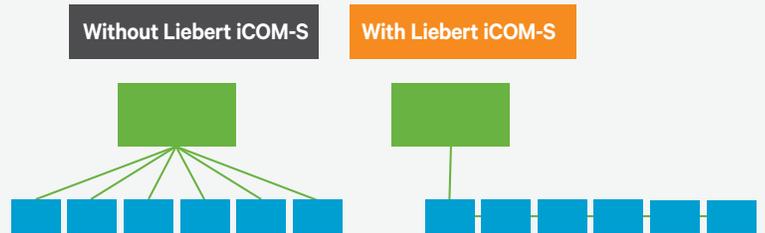
With Liebert iCOM-S

Sensor Auto Configuration

Easy configuration and binding of sensors and cooling units cut deployment times by days.

REDUCE SENSOR DEPLOYMENT COSTS	
500kW Datacenter: 100 racks, 200 sensors, 36 cooling units in 6 groups	
Without Liebert iCOM-S 5 Days	With Liebert iCOM-S 2 Days ↓ 60% Reduced Sensor Deployment Time

Quick Specs: Liebert® iCOM™ Unit Control

- 7" (16:9) HD display

- Capacitive touchscreen; highly responsive

- Display can function as a hand-held device when the cooling unit is in service mode

- 2 USB Ports for simple software updates and system backup and restores

- 2 Ethernet ports for single line connection and integrated open protocols, such as BACNet, Modbus, SNMP, SMS and SMTP

- RS-485 ports to connect into smart devices like EC fans, compressors and heat rejection

Quick Specs: Liebert iCOM™-S System

- 22" 1920 x 1080 (16:9) high-definition capacitive multi-touch screen with mounting hardware

- 2 x USB 3.0 Ports

- 1 x HDMI output

- 48-port network switch

- 4-port router

- Connects directly into machine-to-machine network for Liebert iCOM unit controls

- Power connection for up to 16 daisy-chained gateways (4,800 wireless sensors)

- Room editor to customize floor plan and layout

- **Expansion Options**

  - 100 wireless modules with 3 sensors per module

  - Optional wired sensors direct to units for backup

  - Additional network switches for additional unit connectivity

Vertiv.com | **Vertiv Headquarters,** 1050 Dearborn Drive, Columbus, OH, 43085, USA

SL-18843 (R07/19)