



SynapSense Adaptive Control™

SynapSense Adaptive Control™ provides immediate energy savings and increased efficiency by continuously aligning cooling capacity with changes in IT load.

SynapSense leverages a granular deployment of leading edge wireless sensors used to measure server inlet temperature and subfloor pressure differential to dynamically manage CRAH temperature set points and variable fan speeds. This unique approach to control optimizes cooling capacity and saves 20-35% of cooling costs.

ROI – Save 20-35% of cooling energy

Reliability – Fine grain sensing of both temperature and pressure guarantees control accuracy

Responsive – Dynamically controls CRAH set points and fan speeds

Scalability – Designed to operate in 5K to >100K sq ft; Leverages scale afforded by SynapSense Environment Environmental Monitoring and Energy Management Solution

Ease of Use – Enables user-initiated or system-initiated transitions from Automatic to Manual Mode

SynapSense Adaptive Control

features the security, redundancy and resiliency expected of an enterprise-scale solution.

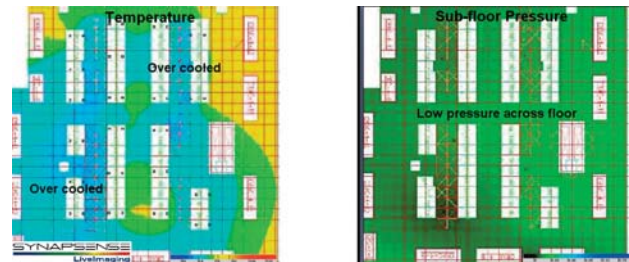
SynapSense Data Center Assessment and Optimization Services

complement our **Adaptive Control Solution** by baselining the data center cooling capacity and optimizing airflow prior to implementing Adaptive Control. This serves to increase reliability, availability and capacity. With SynapSense Adaptive Control, data center operators can fully automate cooling of their data centers which results in immediate energy savings and increased efficiency. Adaptive Control allows data center operators to add IT load, while avoiding the capital cost associated with incremental cooling capacity.

The Adaptive Control three-step process includes:

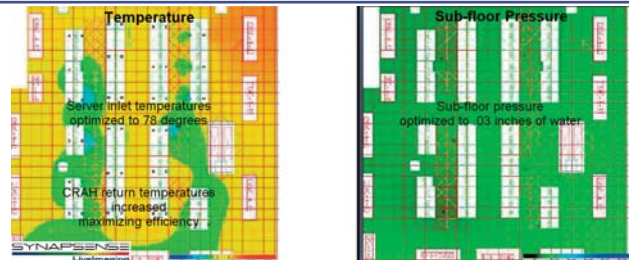
1. Baseline the Data Center, including environmental conditions, total IT load, cooling capacity and cooling efficiency.

Baseline Temperature and Pressure



2. Optimize Airflow Management. Using industry best practices, SynapSense provides a data driven optimization analysis and set of recommendations, detailing potential optimization opportunities, with corresponding cost, expected energy savings and overall return on investment (including payback period). Optimization includes, rebalancing the raised floor, air-mixing mitigation, and matching cooling capacity to IT load.

Improve Airflow Management



3. Adaptive Control optimizes cooling capacity and saves 20-35% of cooling costs by minimizing the fan energy to meet server CFM requirements, while maintaining acceptable server inlet temperatures in the ASHRAE range.

Adaptive Control



Product Specifications

Server and Client Specifications

Minimum Server Requirements

- Processor: X2 Quad-Core Xeon E5420 2.5 GHz or equivalent
- Memory: 8 GB RAM
- Hard Drive: 500 GB
- Connectivity: 2 Gigabit Ethernet adapters

OS Compatibility

- Windows Server 2003 (32, 64-bit)
- Windows Server 2008 (32, 64-bit)

System Requirements

- Email: SMTP server capable of sending alert notifications

Client PC Requirements

- Minimum Screen Resolution: 1280 x 1024
- Browsers: IE 7.x or higher; Mozilla Firefox 3.x or higher
- Flash Plug-in: Adobe Flash Player 10.x or higher

Wireless Communication

Gateway Node

- Ethernet Connectivity to server
- Power: External 5VDC Power Adapter, 110-240VAC, (50~60Hz)
- Ethernet Throughput: 256 kbps
- Security: Lantronix XportAR: Rijndael 128-bit encryption, password protection, IP address filtering, locking features, hardened OS and stack

Wireless Node Specifications

- Power: 4 Energizer AA lithium-ion batteries (L91)
- Typical Battery Life: 4-6 years
- Operating Temp: 0°C -50°C (Indoor Use Only)
- Warranty: 1 year
- Certification: FCC Part 15, Subpart C, 15.247 ; Industry Canada; CE Marking EN 300 328; V1.7.1 (2006-05) and EN 300 440-2 V1.1.2 (2004-07)
- Radio: 2.4 GHz, ISM unlicensed band IEEE 802.15.4 MAC Data rate maximum: 250 Kbps Max RF output power: 0dBm Typical RF Range: 15m Maximum RF Range: 80m

Wireless Nodes and Sensors

ThermaNode™:

Usage: Temp/Humidity/Dew Point Internal Sensed Data

Dew Point Sensor

Operating Range: 10°C-35°C, 20%RH – 80%RH

Accuracy: Nominal +0.5°C–0.5°C

Temperature Sensor

Accuracy: 10°C-43°C: ±0.3°C

0°C-10°C & 43°C-50°C: ±0.7°C

Time Constant: 230 seconds moving air

External Sensed Data

Up to 6 thermistors

Temperature Range: 0°C-50°C

Accuracy: ±0.3°C

Operating Range: 0°C-50°C

Time Constant: 30 sec moving air;

60 sec static air

Pressure Node:

Usage: Differential Air Pressure

- Differential Pressure Range: -500 to 500 Pa (-2.0 to 2.0 inH₂O)
- Zero point accuracy: ±0.5Pa (0.002 inH₂O)
- Span Accuracy: ±3% of reading

Constellation Node:

Usage: Integration with 0 - 10V and 4-20mA inputs

- Power: External 24VDC Power Adapter where applicable (110-240VAC, 50~60Hz)
- Four 4-20mA analog inputs
- Two 0-10V analog inputs
- 4-20mA Accuracy: ±1.2% Full Scale
- 0-10V Accuracy: ±1.6% Full Scale

Power and Energy Metering

Branch Circuit Monitoring

Usage: Circuit Level Metering

- Capacity: Up to 84 branch circuits
- Power Measurement : 50 and 100 amp CTs available
- Configuration: Wall or subfloor mount
- Accuracy: ±1.0% for current, ±3.0% for power

Chilled Water Energy Meter

Usage: Volumetric flow, pipe temp

- Range: 0 - 300 kWh/5 minutes
- Dual and Single flow
- Accuracy: Flow ±2.0%, pipe temperature ±0.6°C, energy ±4.0%

Power Sensing

Electrical Power Sensor

Measurement: 3 Phase, 208 to 480 VAC, 50/60Hz

Supports: Delta/Wye options

Current: Available CTs from 50 - 4000 amps

Accuracy: IEC 60687 Class

0.5/ANIS C12.20 0.5 compliant

Certifications: UL, CE

True RMS Current Sensor

Range: 0 - 200A RMS

Frequency: 50 - 60Hz

CT Accuracy: ±0.5%

Other Sensors

Rope Style Leak Detection System (Contact)

- Available Lengths: Up to 1000 ft

Door Status (Contact)

- Magnetic Sensor

Equipment Status (Contact)

- Range: 1 - 150Amps
- Frequency Range: 50 - 60Hz

Particle Counter Measurement (4-20mA)

- Particle size: 0.45 - 25Pm
- Accuracy: ±1.8%
- Counting Efficiency: 100% for particles > 0.75Pm (per JIS)



To learn more, visit www.SynapSense.com.

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SYNAPSENSE™

Wireless Instrumentation Solutions

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