

Emerson Network Power Data Center Infrastructure

Kiev

24th November 2010



A Powerful Force for Innovation



EMERSON
Network Power

Emerson At-a-Glance 2009

\$20.9 Billion in sales



Headquarters in
St. Louis, Mo.
NYSE: EMR



Diversified global
manufacturer
and technology provider



Approximately 129,000
employees worldwide

- **Manufacturing and/or sales presence in more than 150 countries**
- **255 manufacturing locations, 165 outside the U.S.**
- **No. 94 on 2009 FORTUNE 500 list of America's largest corporations**
- **Founded in 1890**

Emerson – “Consider It Solved”

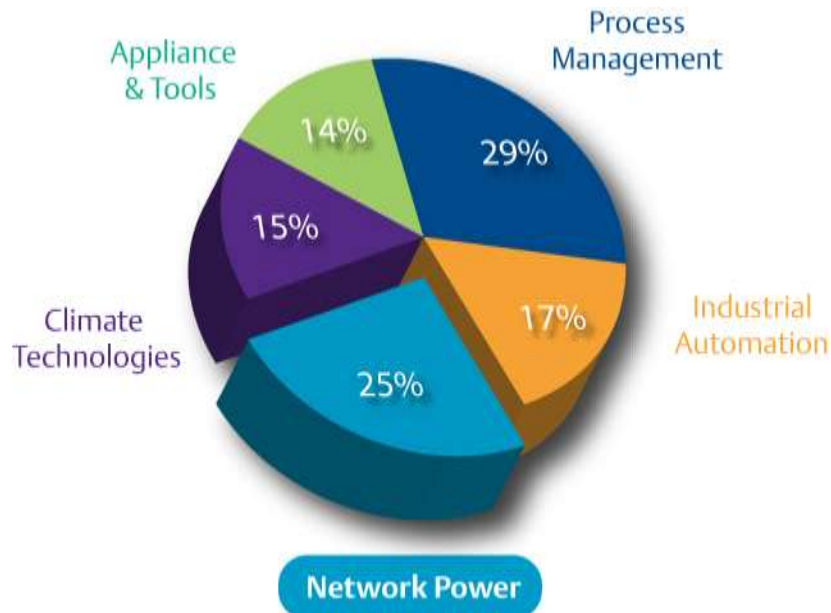
Sales Profile

FY09

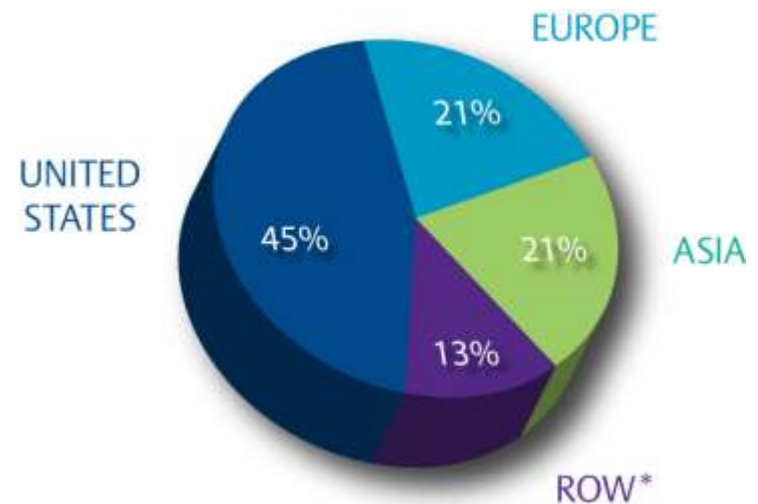
Sales

\$20.9B

2009 Sales by Segment



2009 Sales by Geography



* Rest of World

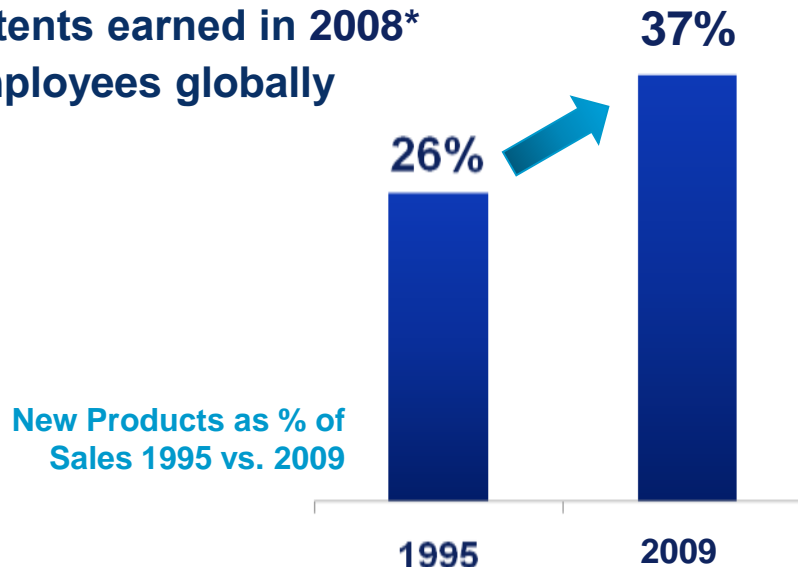
Emerson is Committed to Identifying and Meeting New Customer Needs

\$685 million ... Emerson's investment in Engineering & Development during 2009

7,700... number of Engineering & Development personnel worldwide

37%... increase in new products as percent of Emerson sales between 1995 and 2009

655... new patents earned in 2008* by Emerson employees globally



*2009 patent data not available until Jan 2010

Emerson Network Power

Putting **Global Resources** to Work For You

■ Total E&D Spend:	\$254 M
■ Total E&D Engineers:	3,332
● North America:	617
● Western Europe:	230
● Eastern Europe:	54
● Asia:	2399
● ROW*:	32
■ Number of PhDs:	50
■ Number of Active Patents:	1396



**Technology that Transforms an industry
and changes the way business is done**

**Transformational Technologies are Sources of Sustainable
Competitive Advantage for those who develop them
and Disruptive to those who do not**

Emerson is a Leader in its Core Global Businesses & Markets



- #1 AC & DC Power Systems
- #1 OEM Embedded Power
- #1 Precision Cooling Systems



- #1 Control Valves
- #1 Measurement Devices



- #1 Compressors
- #1 Controls



- #1 Alternators
- #1 Fluid Control
- #1 Ultrasonic Welding



- #1 Garbage Disposers
- #1 Appliance Components



- #1 Fractional Motors



- #1 Storage Solutions



- #1 Plumbing Tools
- #1 Wet/Dry Vacuums
- #1 Pressing Tools/Jaws
- #1 CCTV Inspection Systems

Emerson Network Power

FY 2009 Sales \$5.4B

The #1 market leader in
„High Performance Air Conditioning“
and
UPS
Worldwide!



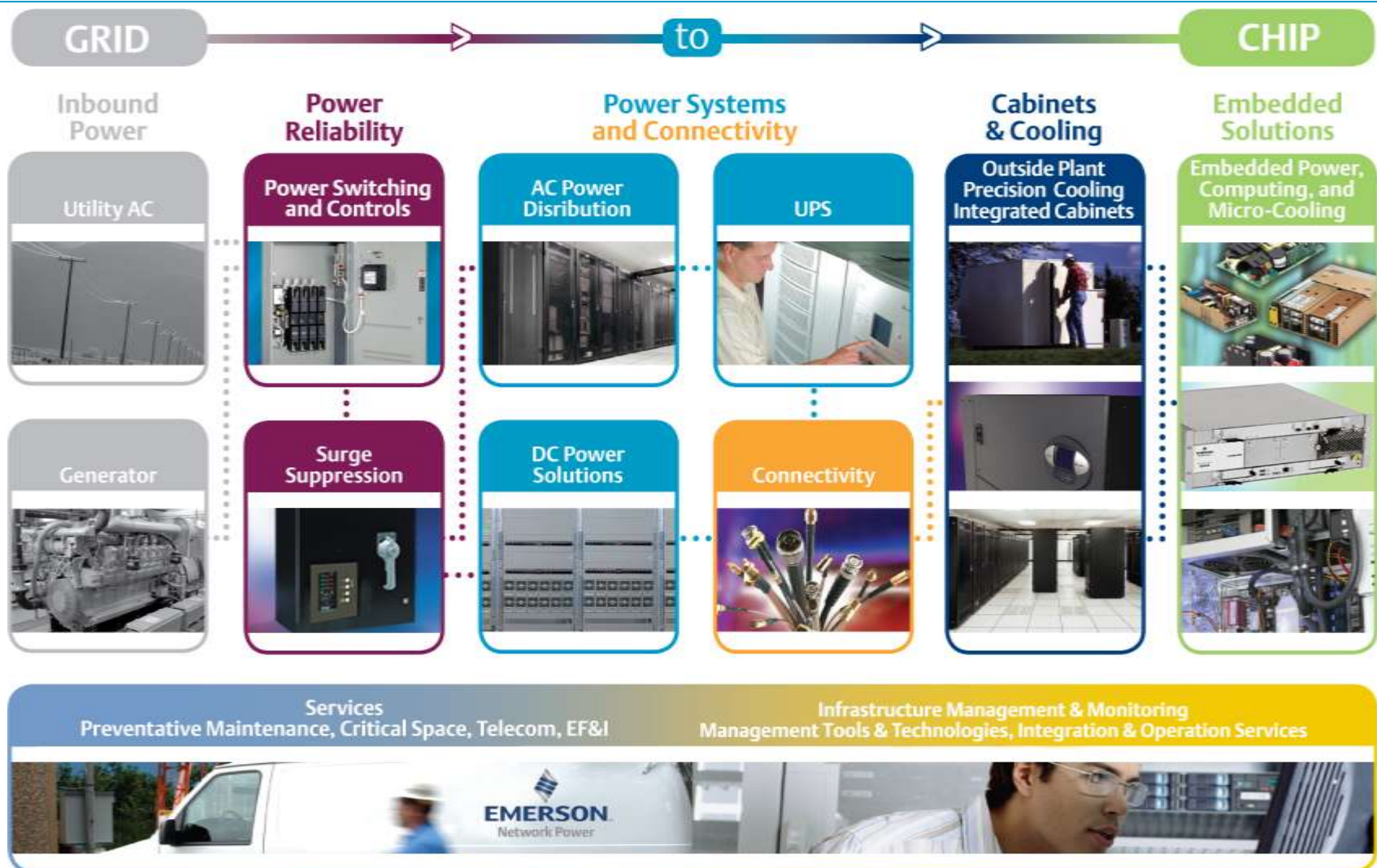
**Network
Power**

#1 AC & DC Power System
#1 OEM Embedded Power
#1 Precision Cooling System

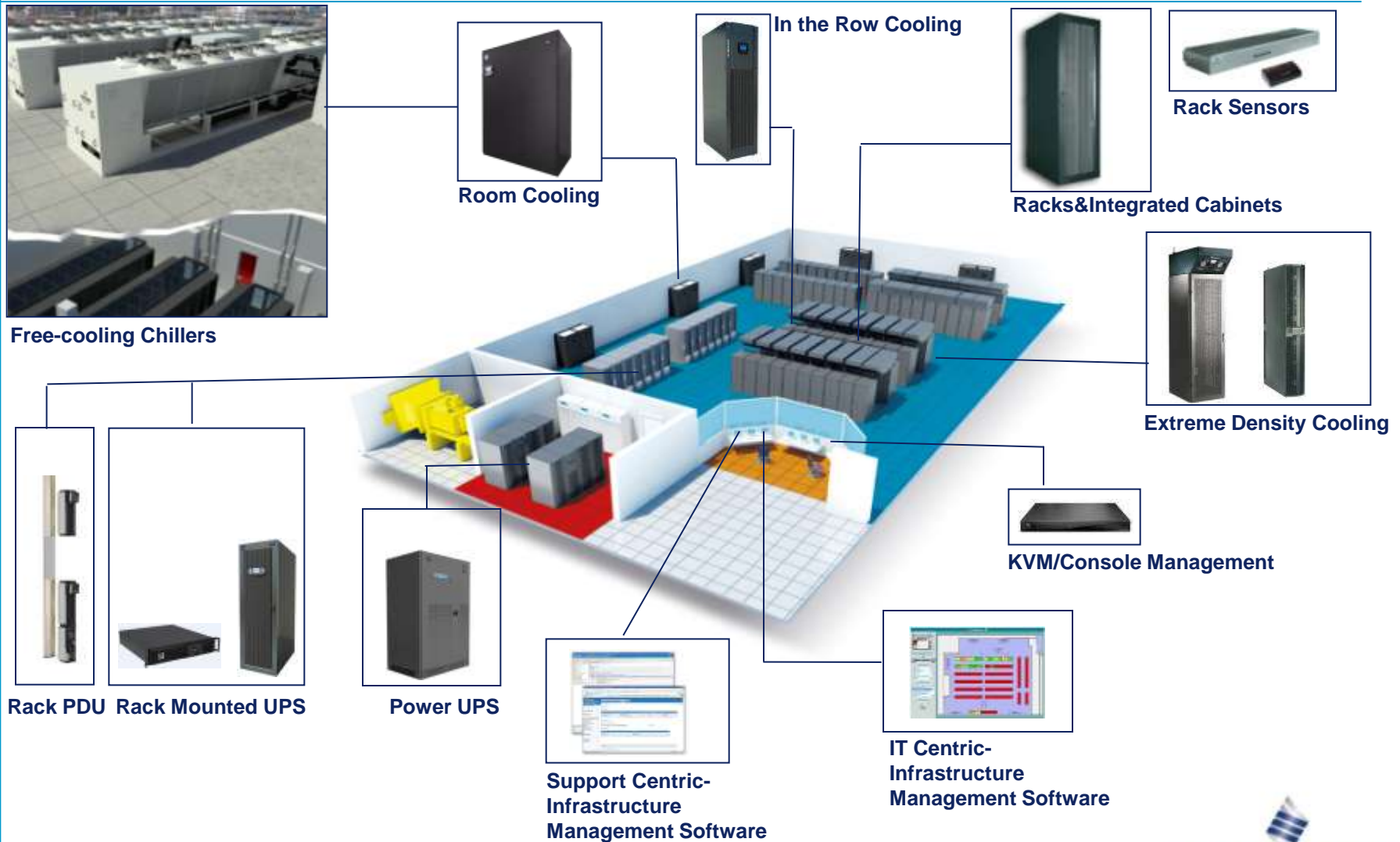


Emerson Network Power

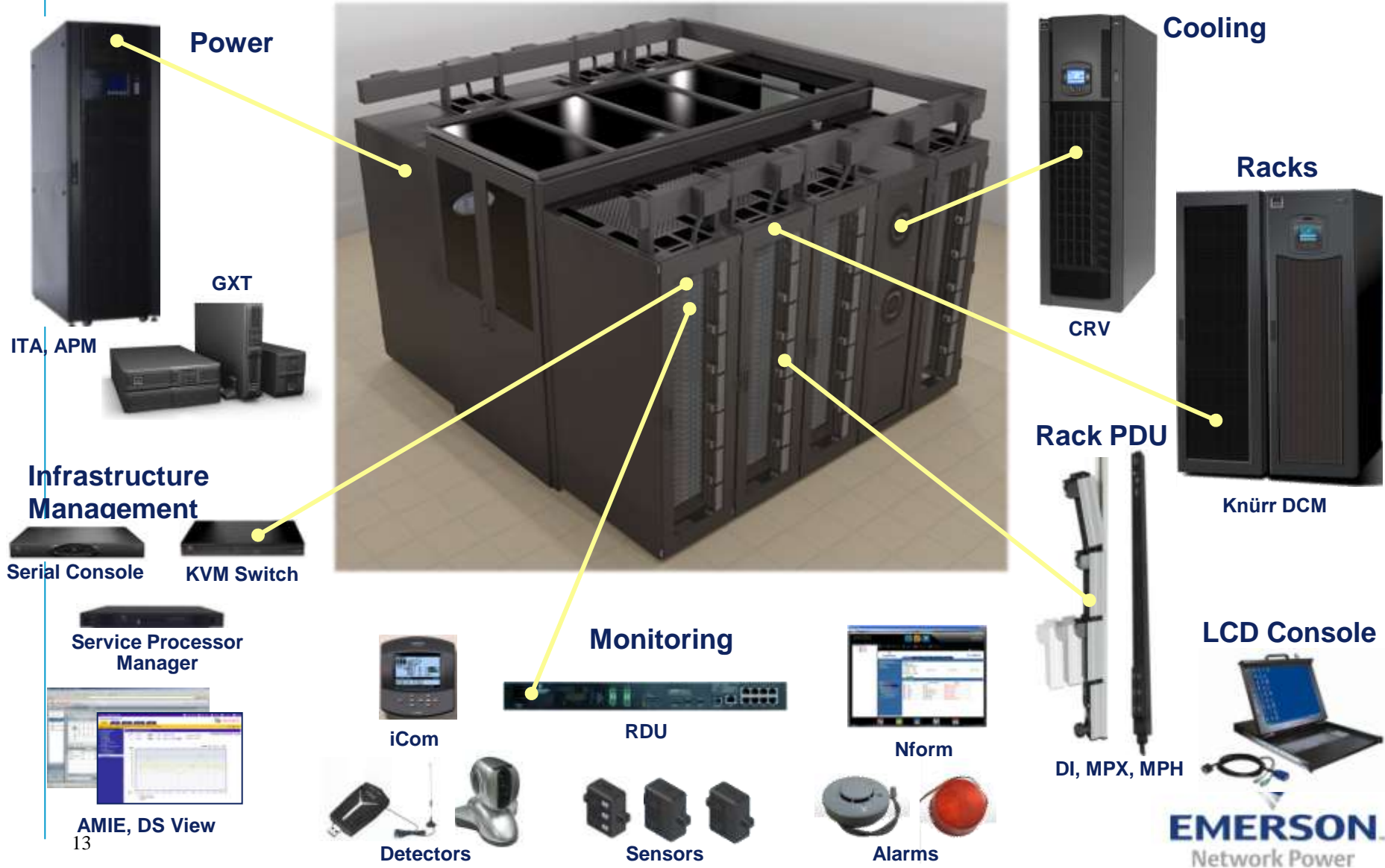
Enabling Business-Critical Continuity™



Data Center Infrastructure



Portfolio of Products to Deliver Integrated Solutions



AC Power Systems (UPS)

AC Power



- Rackmount UPS (0~3kVA) for desktops, servers, telecom closets
- Desktop UPS (3~20kVA) with completely redundant system controls, power modules, battery modules and monitoring options
- Network UPS for on-line protection of network servers, bridges, hubs, routers, storage devices and critical workstations
- Large Facility UPS with continuous availability for large data centers and facility-wide protection of sensitive electronics
- Dual-UPS Systems in Parallel
- Power Distribution
- Rack PDUs

▼ Products



Rackmount
UPS



Desktop
UPS



Network
UPS



Large Facility
UPS



Power
Distribution



Rack PDUs

DC Power Systems

DC Power



- **Leading global manufacturer of -48V and +24V network power systems**
 - Modular system architecture facilitates optimal investments
 - Low installation and commissioning cost with pre-assembled and pre-tested units
- **NetSure™ Solutions provide a DC power technology platform of indoor and outdoor integrated systems**
 - 200 year MTBF with over 1.25M units deployed
 - Near **97%** efficiency with **eSure™** rectifiers

▼ Products



NetSure 211 Series 8-125A



NetSure 501 Series 30-750A



NetSure 701 Series
60-8,000A



NetSure 801 Series
1,000-20,000A

Precision Cooling

Precision Cooling



■ Complete line of Precision Cooling and Energy Saving Technologies

- Designed for energy saving
- Precise control of temperature ($\pm 1^{\circ}\text{C}$) and humidity ($\pm 1\% \text{ RH}$)
- Designed for continuous operation
- Flexibility to address custom load arrangement and future upgrades
- Redundancy, monitoring, and diagnostics guard against down-time
- Chip cooling technologies for high performance CPUs

▼ Products



Extreme Density
Cooling Modules



Room Cooling (Small and Large)

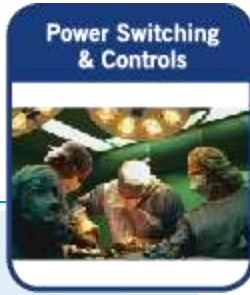


Row Based
Cooling



Data Center
Chillers

Power Switching & Controls



- 30 to 4000 amp, up to 15KV
- Applications for emergency & standby power switching for critical loads
- 100% factory testing, field commissioned via direct service (ASI)
- SCADA software for diagnostics and remote communications & control

▼ Products



ASCO® 7000 Series Switches with Bypass

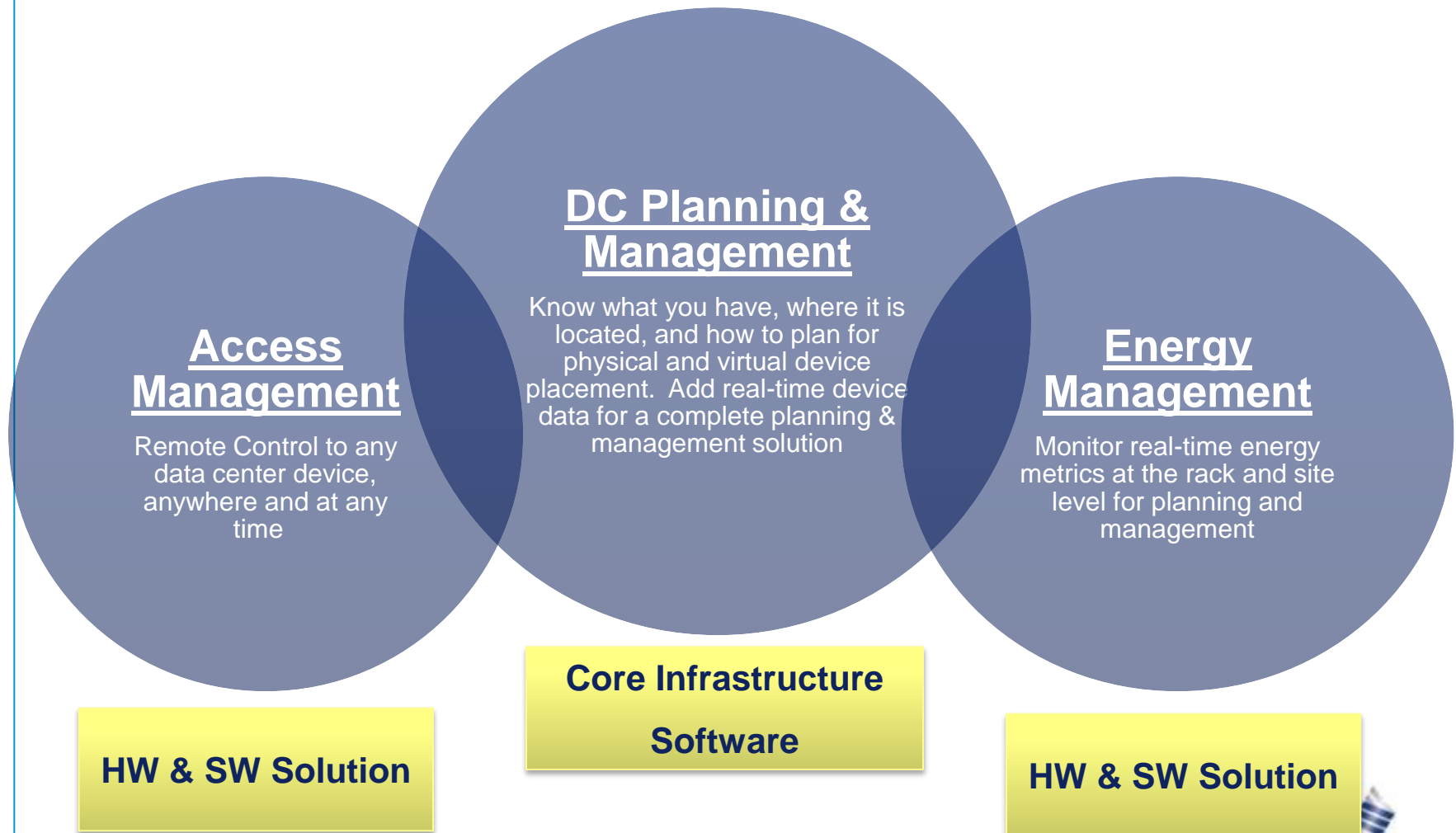


ASCO® Generator Paralleling
Switchgear & Load
Management Control System

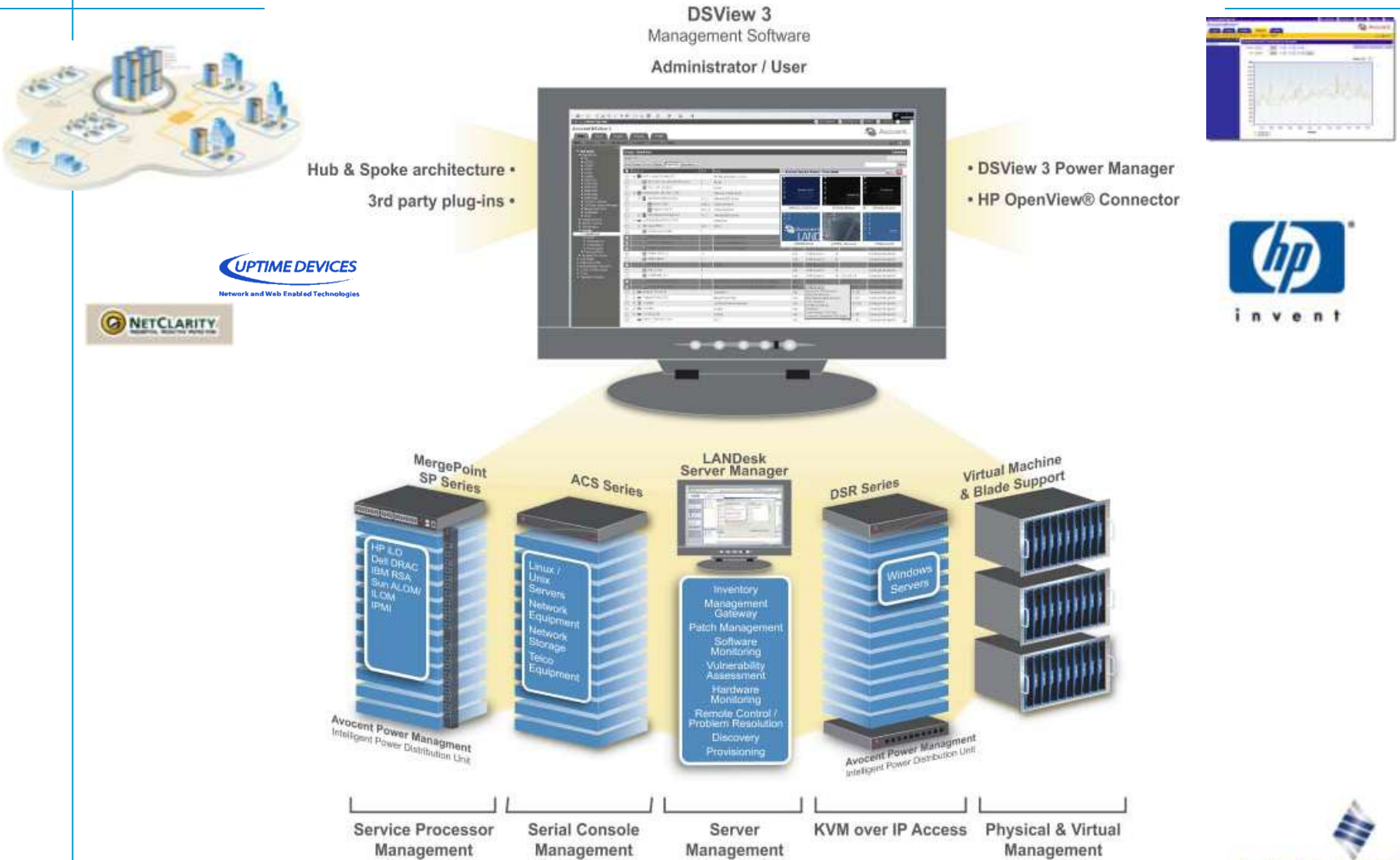


Avocent Data Center Solutions

Planning, Access and Energy



Avocent IT Management Solution



Outside Plant and Enclosure Solutions

Outside Plant



- A full portfolio of cabinet and enclosure solutions primarily for telecom outside plant applications
 - Customized solutions for integrated backup power, cooling & connectivity
 - Cost effective solutions for wireline & wireless applications
- **NetXtend™** cabinets and enclosures that protect and extend the life of equipment and electronics
- **NetSpan™** distribution hubs and pedestals provide a fast, efficient and simple fiber migration path
- **NetReach™** building entrance terminals, cross connect cabinets and pedestals for superior copper connection & distribution

▼ Products



NetXtend Flex Series Integrated Enclosures

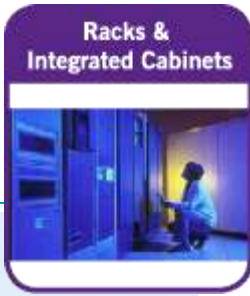


NetSpan FDH Series Fiber Solution



NetReach DSLAM Series Cross Connect Solution

Racks & Integrated Cabinets



- Indoor enclosure systems for telecommunications, electronics, and computing equipment
- Integration of mechanical, electromechanical, electronic components, active sub-systems, thermal and electromagnetic solutions
- Integrated enclosures that include self-contained air conditioning, UPS and wiring management in a sturdy, lockable cabinet
- High Density Cooling modules designed to connect to a computer center's thermal management infrastructure (Refrigerant- and Water-Based)
- High Density Cooling Integrated Racks that manage varying levels of heat loads (Refrigerant- and Water-Based)
- Standard, Distribution, Server, Computer, Co-location & EMI EMC RFI Racks

▼ Products



Knurr Indoor Racks & Accessories



Cooling Integrated Racks
(Refrigerant- and Water-Based)



High Density Modular Cooling
(Refrigerant- and Water-Based)



Rack PDUs



Embedded Power

AC-DC Power

Embedded Power



■ Broad Product Line

- 1w to 6kw
- Single and 3 phase
- Digital Control
- Modular solutions

■ High Efficiency, Density & Reliability

■ Environmentally Compliant

■ Broad Market Participation

- Telecom, Datacom
- Computing, Storage
- Industrial
- Mobile & Imaging
- Medical

■ Major Customers

- HP, Ericsson, EMC, Cisco, Dell, Nokia, Siemens Networks, Nortel, Motorola, IBM, Sun, Philips, GE, Hitachi, Quanta, NEC, Alcatel-Lucent, Agilent

▼ Products



Connectivity Solutions

Connectivity



- Radio frequency coaxial connectors and cable assemblies for wireless and wireline communications
- Microwave components that meet the most rigorous standards of performance for aerospace applications
- Fiber optic interconnect passive and active optical devices serving the video, telecom and datacomm markets

▼ Products



Infrastructure Management & Monitoring for Computing



■ Management solutions that deliver increased visibility and control of critical support systems for single modules, entire data centers or all critical facilities in an enterprise

- Aperture VISTA: Enterprise software for data center infrastructure management – physical resource management, capacity planning, tracking assets and resources, managing equipment installs, moves and decommissions
- Liebert SiteScan Web: Web-based site monitoring, historical data logging, alarm/event management and efficiency/energy usage tracking
- Liebert IntelliSlot and Liebert Nform: Cost-effective centralized status and alarm monitoring of network-enabled Emerson equipment
- Full line of power communications software and hardware products
- Remote monitoring service & third party monitoring system connectivity
- Wide range of water leak detection systems
- Local and remote monitoring panels
- Battery capacity management, monitoring & testing

▼ Products



Aperture VISTA



Liebert SiteScan Web



Liebert IntelliSlot
Web Card



Liebert Universal
Monitoring Panel

INTEGRATED SHELTER SOLUTIONS



The Global Leader in enabling
Business-Critical Continuity™.
Everywhere.



INTEGRATED SHELTER SOLUTIONS



Fully functional solution

Portable – easy to relocate

Targeted for temporary or remote sites

INTEGRATED SHELTER SOLUTIONS



Each integrated shelter type can be configured differently according to project specifications, but will share common engineering expertise

Data Center on the move

Why containerized Data Centers?

- Temporary applications
- A new way for Co-location
- Disaster recovery
- Movies shooting
- Traditional Data Center quick upgrading
- Humanitarian or Military applications
- Sporting events
- Oil industry applications



Data Center on the move

Why containerized Data Centers?

- Flexibility and scalability
 - Containerized Data Centers can cover specific needs (equipment type, cooling...)
 - Easy duplication
- They allow ...
 - Fast deployment
 - To secure critical data and equipment
 - Better use available space



Data Center on the move

Why containerized Data Centers?

- Co-location/housing
 - New business models for co-location and housing
 - Data Center 'on demand'
- Superior performances
 - More power efficiency due to container thermal insulation
 - No noise, no electromagnetic interference issues.



...as a traditional Data Center can't do

Data Center on the move

Why containerized Data Centers?

- In case of ...
 - flooding, earthquake or any natural or human induced disaster requires fast reaction and ready-to-use infrastructures. Portable data centers helps to keep basic public services alive.
 - If a traditional Data Center suffers from natural hazard, the containerized Data Center is the ideal solution for 'disaster recovery'.



Data Center on the move: Complete Data Center Solution

Emerson Network Power Containerized Datacenter Infrastructures combines all the most advanced Emerson Network Power products: cooling, power, racks, monitoring systems, all what your business needs.

- Complete Datacenter Infrastructure (based on Customer Specifications)
- Emerson Network Power **Knürr IT racks**
- Emerson Network Power **Liebert APM UPS**
- Emerson Network Power **Liebert CRV precision cooling**
- Emerson Network Power **Liebert Nform monitoring system**
- Emerson Network Power **Avocent KVM** and other infrastructure management tools
- Fire detection and suppression system



- **Efficiency**
- **Modularity**
- **Scalability**
- **Reliability**
- **Ready to operate**

Inside the Emerson Containerized Data center Infrastructure Solution

Liebert CRV Self-Contained precision Cooling Unit

- 2 Liebert CRV including condensers: 35kW Cooling capacity, 2N redundancy
- iCOM Large Graphic Display
- EC FANs to regulate the airflow and reduce the fan input power
- Copeland Digital Scroll to modulate the cooling capacity
- iCOM control to monitor the heat variations



Liebert APM modular 3 phase UPS system

- 19" rack.
- Modular architecture from 30kW to 150kW in a single rack.
- Battery backup

Inside the Emerson Containerized Data center Infrastructure Solution

Knürr Miracel racks

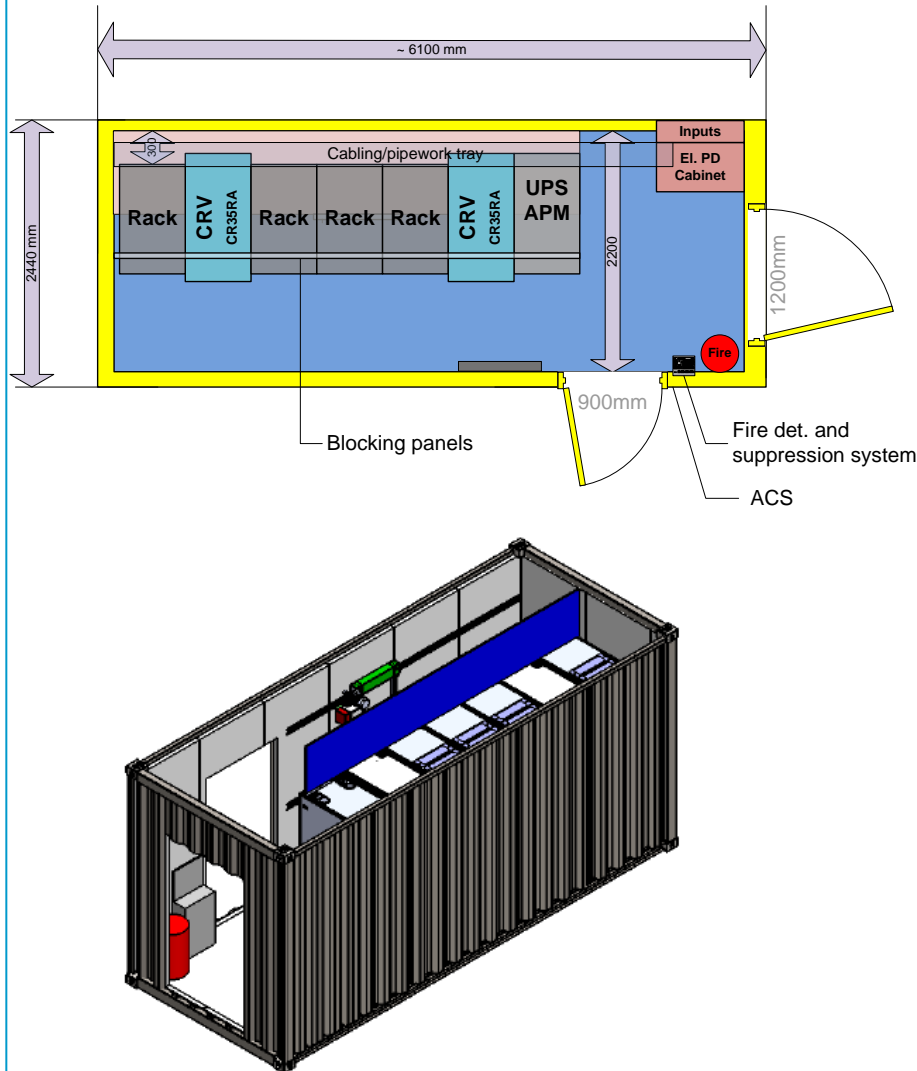
- The rugged aluminum frame is 22kg lighter than a comparable steel frame
- EIA rails and PDU quick mounting rails are designed to mount easily.
- Tool-less cable management allows components to be mounted anywhere in the T slot in the cabinet frame,
- Avocent KVM on board



Liebert Nform monitoring system

- Monitors all vital parameters of the solution.
- Support SNMP and TCP/IP

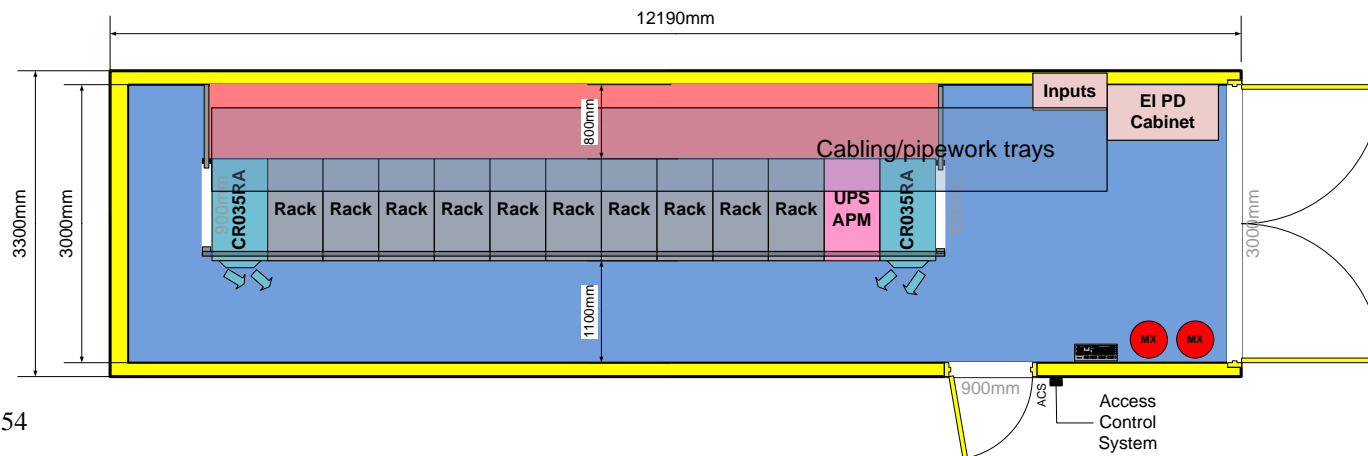
Data Center Infrastructure: Solution 1 (30kW)



- *Modified ISO 20ft High Cube container module (D:2.44m) or Special container module (D:3m)*
- *Dimensions: 6.1m x 2.44m (3m) x 2.9m*
- *IT equipment installed max 30kW*
- *4 x Racks 42U*
- *2N redundancy cooling & UPS*
- *Fire detection and suppression*
- *Early fire detection system VESDA*
- *Access control system*
- *MPH – Intelligent power distribution strips per each rack*
- *Motorized lift for servers*
- *PD Cabinet with ATS, TVSS*

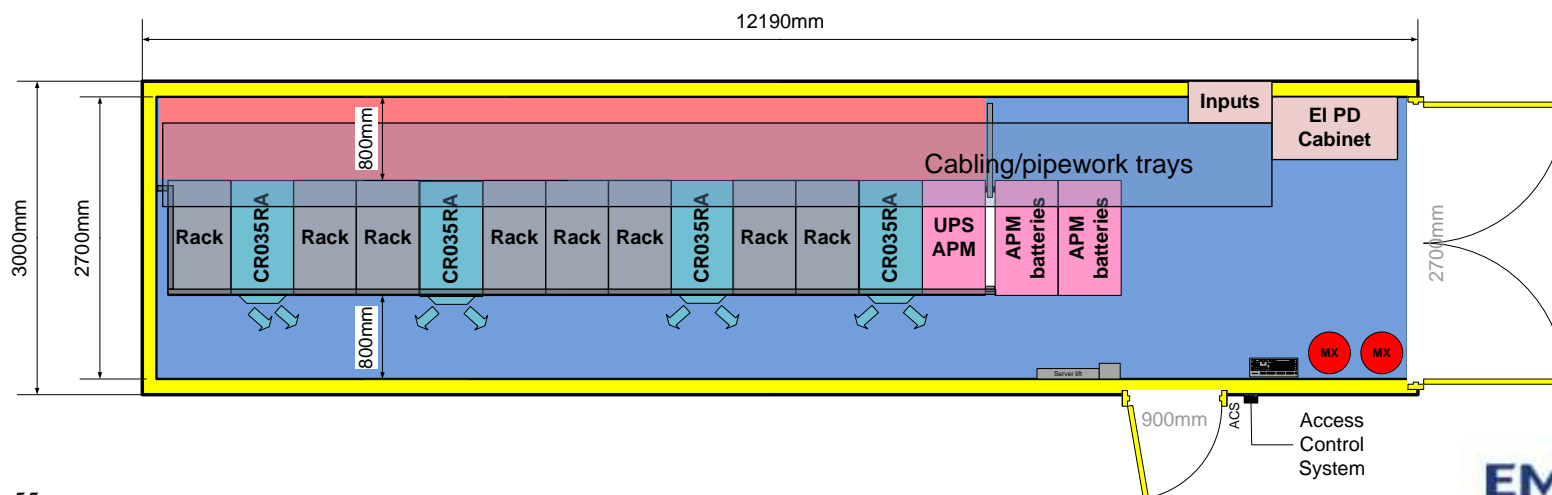
Data Center Infrastructure: Solution 2 (30kW)

- *Special 40ft container module*
- *Dimensions: L:12.19m x D:3,3m x H:2.9m*
- *IT equipment installed max 30kW*
- *10 x Racks 42U*
- *Average Heatload per rack 3.5kW*
- *2N redundancy: cooling and UPS modules*
- *Fire detection and suppression system*
- *Early fire detection system VESDA*
- *MPH – Intelligent rack power distribution strips*



Data Center Infrastructure: Solution 3 (100kW)

- *Special 40ft container module*
- *Dimensions: L:12.19m x D:3m x H:2.9m*
- *IT equipment installed up to 100kW*
- *8 x Racks 42U*
- *N+1 redundancy: cooling and UPS modules*
- *Fire detection and suppression system*
- *Early fire detection system VESDA*
- *MPH – Intelligent rack power distribution strips*



The Best Data Center Infrastructure on the Move!

