SmartRow™ Solution
Intelligent, Integrated Infrastructure for the Data Center

EMERSON
Network Power

Deploy a Fully Configured Data Center in Just Weeks

Availability, Capacity, Efficiency.
You need them – and now you can have them all. Another first from Emerson Network Power.

Introducing the SmartRow™ infrastructure from Emerson Network Power is a simplified, standardized and quickly deployable data center environment with significant CAPEX and OPEX savings over conventional designs. No other solution on the market provides such ease of deployment and integration. This complete data center infrastructure solution allows you to easily deploy and effectively manage an integrated IT infrastructure without being limited by building systems such as fire suppression and cooling.

SmartRow is available in three- to six-rack configurations for up to 20kW of total capacity; and six-rack to ten-rack configurations for up to 36kW of total capacity. The solution allows the flexibility of starting small and expanding over time.

The SmartRow solution is ideal for:

- Build outs of new or existing small and mid-sized data centers.
- Remote data centers for larger enterprises requiring standardized infrastructure.
- Standalone development environments.
- Standalone disaster recovery.

Emerson Network Power has demonstrated up to 10% CAPEX savings over conventional designs and 27% OPEX savings. Here's how SmartRow infrastructure does it:

- Significantly reduces the cost of room upgrades or modifications.
- Optimizes use of space.
- Reduces cooling power usage through contained airflow, and high efficiency technologies.
- Increases IT control and productivity.
- Deploys in weeks, not months.

"Using the SmartRow system we did not have to sacrifice availability and we gained efficiency, so we found that the SmartRow system gave us the best of both worlds. SmartRow saved Pasco County significant dollars. We are able to utilize an average room, we did not have to build a special computer room to install this. That saved us money in raised floor, that saved us money in fire suppression, and that saved us money in room cooling."
—Todd Bayley, Technical Architect-Network information Technology Department, Pasco County, FL[1]

1 Pasco County Case Study. CH-00021 (01/11).

What Makes The SmartRow ™ Offering Unique?

Imagine the advantages of an intelligent, integrated infrastructure with all the capabilities you need to achieve your IT objectives.

The SmartRow infrastructure utilizes seven data center best practices and technologies to achieve a unique set of benefits

1. Maximizes the return temperature at the cooling units to improve capacity and efficiency.
2. Matches cooling capacity with IT load.
3. Utilizes cooling design that reduces energy consumption.
4. Uses power management systems that optimize availability and efficiency.

5. Features a design that enhances flexibility using scalable architectures that minimize footprint.
6. Utilizes real-time infrastructure optimization to provision resources faster, increase efficiency and reduce stranded capacity.
7. Leverages the availability of in-market data center design expertise and technical assistance.

Efficient

- **Reduce annual energy costs –up to 27%** through high-efficiency power, dedicated cooling and management technologies and containment
- **Optimize space efficiency** through an integrated system
- **Reduce maintenance costs** with reliable design and efficient operation that minimizes wear and tear and requires less servicing
- **Increase IT efficiency** by streamlining and centralizing monitoring and management

Economical

- **Reduce time and cost of implementation**; order, install and implement within just weeks
- **Save up to 28% on room upgrades** compared to upfitting a room as a conventional data center

Simplified

- **Simplify implementation** through an integrated design
- **Easily operate and manage** infrastructure systems through integrated controls
- **Ensure continuity** of business operations with single system startup, warranty, preventive maintenance and repair
- **Utilize industry-leading** service and support provided by local data center design experts

Controllable

- **Ensure efficiency and availability** with Liebert® iCOM™ controls — manage cooling to optimize IT equipment performance and life
- **Enhance performance** and anticipate potential problems before they occur with infrastructure monitoring and management appliances and software
- **Increase physical security** and equipment protection with lockable cabinets and access alerts

SmartRow™ Infrastructure: Technologies and Features to Optimize Efficiency and Availability

A simple solution designed to expand IT capacity when you don't have the luxury of more data center space.

The SmartRow solution is ideally suited for environments where dedicated IT room improvements are not practical or cost effective. It is the perfect solution for spaces not designed to be IT environments. And it can be placed unobtrusively into work spaces.

No fire suppression system upgrades to the room are needed since fire suppression is integrated into the solution. No dedicated room cooling is necessary, and it can work in a non-raised floor environment.

This space-saving solution integrates the industry's finest and most efficient infrastructure technologies all within a single row. It is well suited to serve as a primary data center or a separate disaster recovery solution.

1 **High-efficiency dedicated cooling and environmental controls –** Liebert® PDX/PCW™ dedicated cooling system with Liebert iCOM™ controls and patented digital scroll technology to match cooling to rack load

2 **Room-neutral design –** allows this system to be placed virtually anywhere, even in environments where people are working

3 **Secure –** Lockable cabinets and access-triggered alarms work together to put you in control of your environment

4 **Integrated fire suppression –** saves 66% over room-based systems by avoiding room upgrades

5 **Simple, fully integrated infrastructure –** racks, dedicated cooling, management, fire suppression, cable management and power distribution are designed to work together, saving you time and money on installation and operation

6 **Sealed plenums and contained airflow –** provide greater cooling efficiency

7 **Integrated emergency fans -** operated by UPS in case of outage to exhaust heat

8 **Comprehensive, remote data center infrastructure management –** Liebert Nform™ and Avocent® appliances and software provide comprehensive, remote monitoring and control

9 **Flexible platform for easy configuration –** SmartRow DCR racks accommodate any type of IT or networking equipment, and maximize space utilization

10 **Reliable on-line uninterruptible power –** Liebert GXT4™ UPS with the industry's smallest footprint and / or the flexible 5-20kVA Liebert APS™ modular, redundant UPS for row -based applications.

11 **Flexible rack PDUs —** MPX™ adaptive rack PDU or MPH2™ managed rack PDU provide flexibility and power control at the receptacle level, and faster implementation of IT equipment

12 **Low-voltage cable entry** in top and rear of plenum

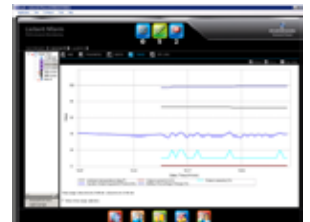**13** **Power connections -** and heat rejection connections

SmartRow™

Simple, fully integrated infrastructure – racks, dedicated cooling, management, fire suppression, cable management and power distribution are designed to work together, saving you time and money on installation and operation.

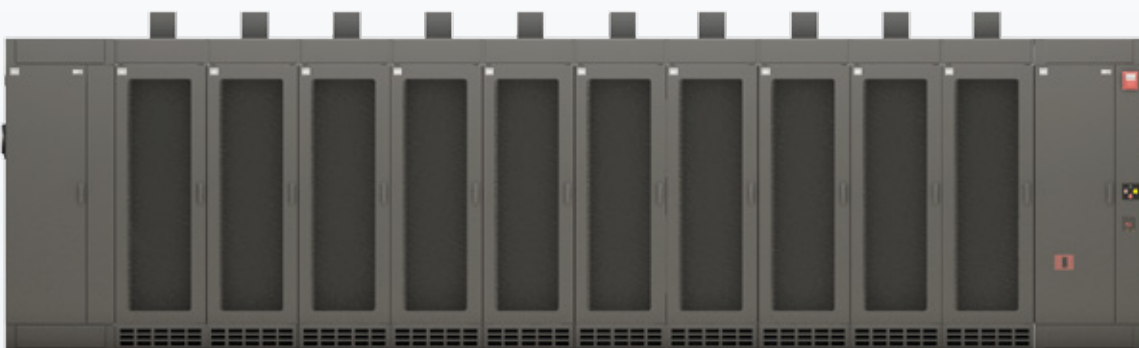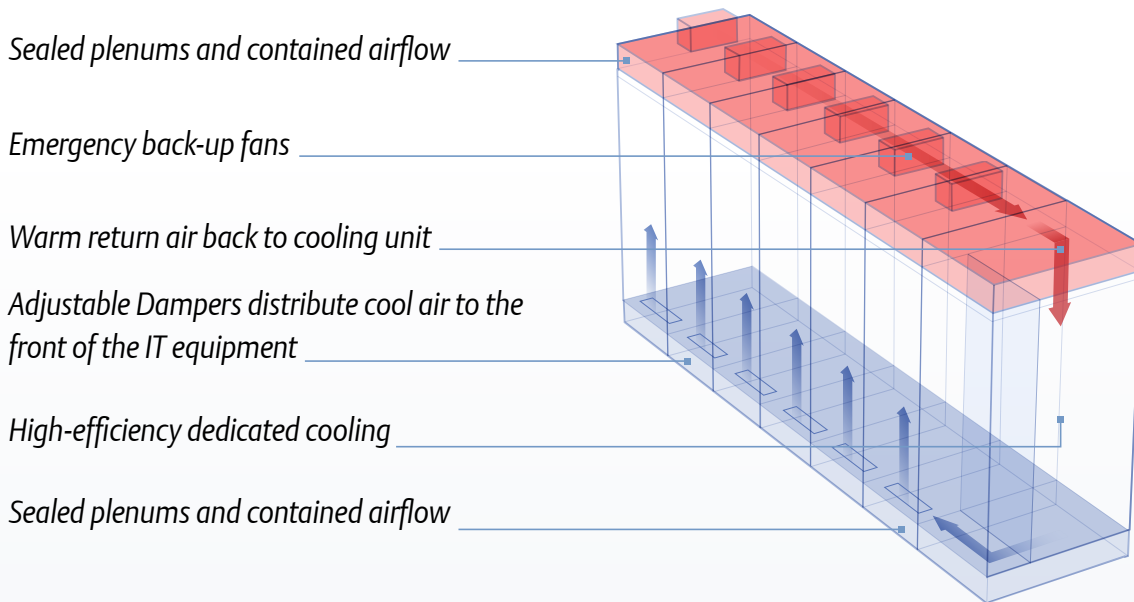Real-time monitoring of power and cooling status.

Trending – Map performance over time

Liebert® Nform™ Centralized Monitoring Software allows centralized, real-time monitoring for any SNMP device that supports a network interface.

- Monitors and controls a wide range of support systems - such as Liebert cooling and UPS systems.

- Triggers event actions such as email alerts or notifications.

- Allows more runtime to most critical systems by sending shutdown commands to user-defined non-critical systems.

- Simplified installation and configuration.

- Advanced graphics and user-friendly navigation enhance usability.

Efficient and Economical

The SmartRow design provides an economical solution for fast deployment and efficient operation.

- Significantly reduces the cost of room upgrades or modifications. These costs add up and can include raised flooring, room cooling systems and fire suppression expansions. All of these can be integrated in the SmartRow offering, and the whole solution can be assembled with limited man power in as little as a day.

- Optimizes use of space. The SmartRow DCR unit has a minimum footprint of only 39 square feet and can fit in a room as small as 10 ft. x 19 ft. (w x d) (3 Rack Primary Configuration).

- Reduces cooling power usage through contained airflow, digital scroll compressor technology and Liebert® iCOM™ controls. Instead of cooling an entire room as in conventional designs, the SmartRow infrastructure cools only the rack space. It boasts a Power Usage Effectiveness (PUE) rating of 1.4.

- Increases IT control and productivity by offering integrated data center infrastructure management technologies that make moves/adds/changes easier and support remote monitoring and management.

Sealed plenums and contained airflow

Emergency back-up fans

Warm return air back to cooling unit

Adjustable Dampers distribute cool air to the front of the IT equipment

High-efficiency dedicated cooling

Sealed plenums and contained airflow

SmartRow™

Highly favorable CAPEX

- Save up to 28% on room upgrades compared to upfitting a room using conventional data center design.

Highly favorable OPEX

- Reduced energy costs from more efficient cooling and server performance – up to 27% savings through high-efficiency power, cooling and management technologies and containment.

- Lower preventative maintenance costs than a traditional data center – one data center reduced expenditures by as much as 33%.

By reducing the cost of energy, space, service and IT management, the SmartRow solution makes your infrastructure decisions smarter and easier.

|	Conventional Data Center Design	SmartRow Design	Cost Savings	% SmartRow Advantage
Room Costs	$ 60,000	$ 43,000	$ 17,000	28%
Infrastructure Costs	$ 105,000	$ 109,000	- $ 4,000	-3%
Total Capital Expense	$ 165,000	$ 152,000	$ 13,000	8%
Energy Consumption	$ 8,700	$ 6,400	$ 2,300	27%
5 Year OpEx	$ 44,000	$ 32,000	$ 12,000	27%
5 Year TCO	$ 209,000	$ 184,000	$ 25,500	12%

MPX™/MPH2™ Rack PDUs

Adaptive and managed rack power distribution units allow remote monitoring and control at the receptacle level, as well as monitoring of environmental input options such as rack temperature and humidity. Rugged construction and industry's leading operating temperatures.

SmartRow
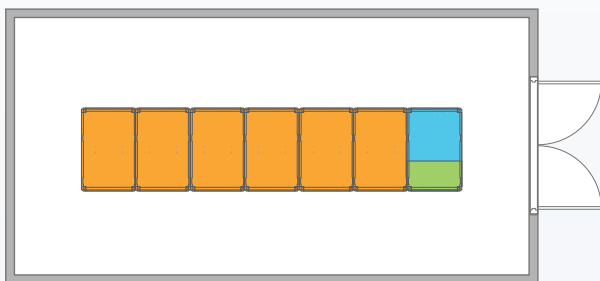
18 kW, 288 sq ft
6 racks
1 Precision Cooling System
6 Rack UPS Systems
Room neutral

Conventional
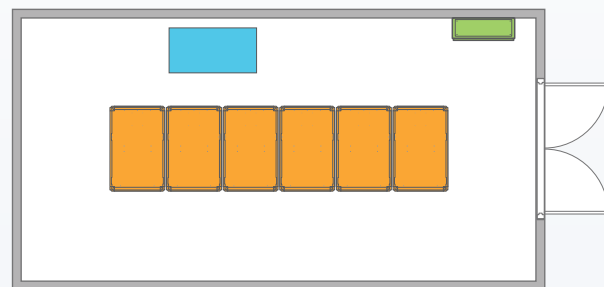
18 kW, 288 sq ft
6 racks
Ceiling mounted ducted cooling
6 Rack UPS Systems
Room renovation, fire suppression

Dedicated cooling

AC Power

Racks and Integrated Cabinets

Emerson Network Power, a business of Emerson (NYSE:EMR), protects and optimizes critical infrastructure for data centers, communications networks, healthcare, and industrial facilities. The company delivers software, hardware, and services that maximize availability, capacity, and efficiency for your business

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