



DATA CENTERS, CLOSETS and SERVER ROOMS Remote Monitoring Solutions



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How Data Centers, Closets and Server Rooms can reduce energy consumption, and implement reliable, low-cost monitoring solutions to achieve smarter, safer, and more efficient operations.

Introduction

“Data center managers will need to deploy more forward-looking capacity management in these areas to be able to proactively meet the business priorities associated with IoT.”

— Joseph Skorupa, Gartner Inc., Vice President and Analyst (ITBusinessEdge)

IT Business Edge.com predicts a massive increase in the amount of input data from globally distributed sources. As such, organizations will be forced to aggregate data in multiple distributed, IoT compatible mini-data centers, where initial processing takes place, as relevant data is forwarded to a central site for additional processing.

Enormous Numbers, Capacity and Analytics

Sheer numbers of devices, velocity, IoT structure, will increase the real-time quantity of IoT data, which will force providers to deal with associated Data Center challenges in security, capacity and analytics.

IoT architecture presents significant hurdles for Data Centers striving to manage entire information environments as “homogenous entities.” This makes monitoring and control of local or distributed assets, and building data vitally important to business interests and value.

It is also worth mentioning ITBusinessEdge pointed to vast amounts of IoT data likely to create governance issues, such as need for additional network and remote storage bandwidth, and the capacity to back-up tons of raw data.

According to Gartner Inc. Research Director, Fabrizio Biscotti, comprehensive business applications and data stream scenarios will impact Data Center design to reduce complexity and boost on-demand capacity that delivers reliability and business continuity.

Common Data Center Frustrations

Monnit receives a high-volume of requests for information about how its Remote Monitoring Solutions can optimize performance and environment for Data Centers, Server Rooms, and Data Closets. Among the many environmental and operational Data Center concerns Monnit can help with, these rank highly:

- Server rack temperatures
- Water detection under subfloor
- Efficient energy use and consumption
- Access to secure areas
- Environmental control
- Airflow and cooling systems

Aligning IT and Operational Technology (OT)

ITBusinessEdge.com reported findings from Gartner Inc. that identified seven key influences on the changes in store for Data Centers. The first being the inherent security challenge of digitization and automation of multitudes of devices across different areas of modern urban environments.

Enterprise and Big Data will impact availability requirements, and free a vast amount of data about personal device use that if left unsecured, which could potentially place personal information at risk.

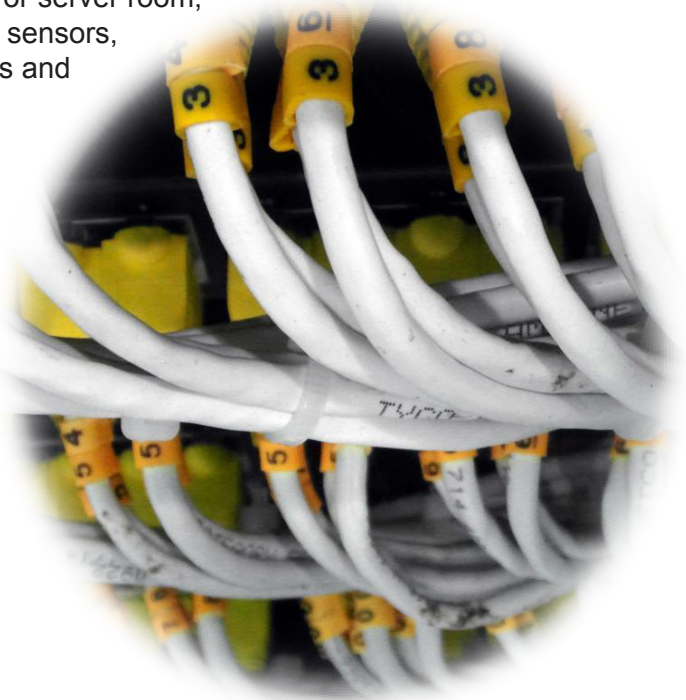
As business' utilize more apps and learning devices, whether consumer or enterprise-driven, more data will be generated, which will require cost-effective storage and supporting environmental control. The same is true for WAN data center links.

Data Storage and Environment

Whether you house data in a closet, large offsite center or server room, each is full of sensitive electronics, from storage arrays, sensors, switches and WI-FI routers, to server racks, patchboards and phone lines.

Strong Data Center management is really about maintaining suitable environment control that involves adequate temperature controls, balanced moisture and humidity levels and clear ventilation.

Environmental concerns range from changes in differential air pressure, clutter and disarray, airflow in aisles and equipment proximity, to power volatility that may cause sudden power losses, spikes or damaging server blackouts. Other potential threats to data integrity can come from contaminants, vibration, shock and fire.



Using Monnit Remote Monitoring Solutions, companies can remotely monitor and manage Data Center systems and environment from anywhere, anytime. This means you can securely record and exchange data, and receive immediate alerts about issues before they become costly, time-consuming problems.

Likewise, data center access and privacy are also important environmental considerations that can also be monitored remotely.

Competitive Data Center Advantage with The Internet of Things

The Internet of Things (IoT) represents a network of physical objects (“things”) embedded with sensors capable of network connectivity, which enables them to collect and exchange critical operational data. The IoT has been around for years, and its wide applications are rapidly becoming a necessary business technology.

Monnit Remote Monitoring Solutions include humidity, temperature, water detection, motion detection, door contact closure sensors and much more, which can help optimize data center or closet performance by improving operational efficiency and reducing costly downtime.

DatacenterDynamics.com’s *Emerson issues ten common surprises of data center operations* outlined ten of the most common operational surprises for data centers. The list included, IT-loads that vary dramatically from one business to the next, and a new generation of servers that actually tend to use more power than older ones.

Examples included financial institutions who see heavier data flow during traditional peak business hours, as compared to very little overnight traffic. The article also identified holiday and tax season traffic that can spike unpredictably.

Today’s data centers, server rooms and closets all need scalable monitoring solutions with intelligent controls, to help maintain environmental conditions that support and optimize data center performance and value.





Out with Clipboards, in with Monnit Solutions

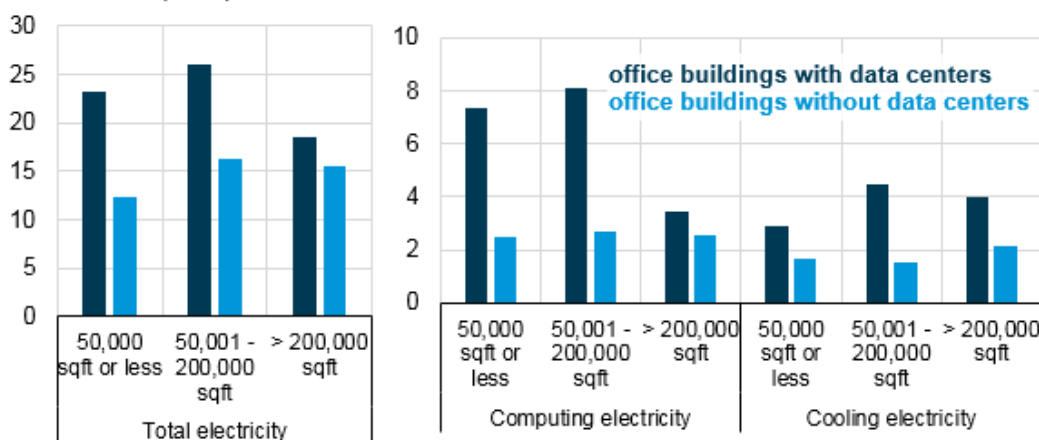
Monnit helps improve processes that have traditionally been manual. This is important since manual processes increase the possibilities of errors and they are difficult to track. Data Centers, server room and closet environments can now be monitored and precisely controlled by non-specialized personnel or facility managers via internet-enabled devices, smartphones or tablets.

With a Monnit Remote Monitoring Solution, errors can be discovered quickly to prevent costly damages. Monnit solutions can help increase processes to high-quality levels while also reducing delay and oversight.

- Cost-effective, high-ROI energy management.
- Solves interoperability problems that normalize data and deliver it accurately and securely to cloud-based services.

Data Centers and Smarter Energy Use

Electricity intensities in office buildings with or without data centers (2012)
kilowatthours per square foot



Source: U.S. Energy Information Administration (EIA). 2012 Commercial Buildings Energy Consumption Survey: Energy Usage Summary.

Rising energy costs are causing businesses to consider smart technology as an energy conservation strategy. Power consumption needs to be reduced *without* compromising proper humidity, carbon dioxide, or temperature levels.

One uncompromising solution is a Monnit AC Current-meter, which can help optimize Data Center energy consumption. A Berkeley Lab News Center article, *Data Centes Continue to Proliferate While Their Energy Use Plateaus*, sees real savings in future energy-use reductions reflected in the continuing IT-industry shift to cloud-computing model. Berkeley listed three reasons for increasing data center efficiency: cooling and powering, server “power proportionality,” or the ability to scale back power usage when doing less processing, and finally, sharing resources and virtualization using cloud services.



Energy Cost-Savings for Data Centers

Increased amounts of data in distributed data centers, closets and server rooms all utilize as much as 100 to 200 times more energy than standard office spaces, as identified in Pacific Gas and Electric Company's *Data Center Best Practices Guide*. It also pointed to data center IT loads that use even moderately efficient cooling systems accounting for as much as *half* its energy use.

Pacific Gas and Electric Company's guide described typical data center infrastructure that saves one Watt of server power, can *save more than \$15 over a three-year server lifespan*, assuming a \$6.00/Watt with an annual electric rate of \$0.14 per kWh.

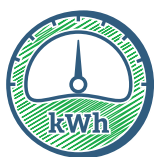
It identified rack servers as the biggest energy consumers, capable of producing concentrated heat loads in facilities of all sizes, making airflow management crucial to operational efficiency and reduced cost. Humidity and contamination also require careful control within an allowable range of 20 to 80 percent relative humidity.

Moreover, driven by a shift to affordable yet powerful IoT devices and building controls, data center operation and energy savings can translate into profitable returns. The IoT@Intel blog suggests, ROI from IoT sensors, switches, and analytics can appear in as little as six months to two years, a fraction of the time it takes to recoup investment in traditional Building Management Systems (BMS) systems.

Along with detailed support data, additional benefits beyond purely monetary savings can include tenant appeal, retention, sub-metered billing, sustainability, and environmental stewardship can also be realized. (IoT@Intel, 2016)

DATA CENTER EFFICIENCY WITH IOT

Between 2010 - 2012, 620 billion kWh of electricity were saved, thanks to efficient IoT.
In 2014, 1.8 percent of total U.S. electricity consumption went to data centers.
For 2020, this represents a potential 45 percent data center energy savings.



620bn

kWh of electricity were saved, thanks to efficient IoT from 2012 - 2014.



1.8%

Of total 2014 U.S. energy use was from Data Centers.



45%

Energy savings can be realized in data centers by 2020.

All-In-One Monitoring Solution for Data Centers

Monnit was contacted by a large company with a large internal data center, and a weekend plumbing problem. Their existing system monitored for temperature and humidity, but surprisingly, they had no system in place to detect water.

Unexpectedly, a toilet outside the data center leaked over a weekend, flooding into the data center. The water intrusion caused an electrical short that took down several server stacks and caused unreparable damage to some of their electronics. As a result, a leaky toilet caused over \$35,000 in damages.

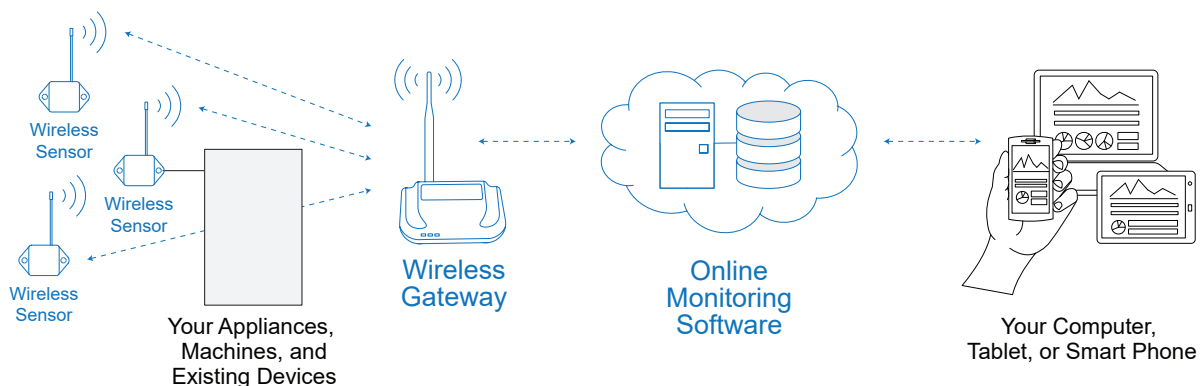
For an initial investment of ~\$1,000 they were able to deploy a Monnit Remote Monitoring Solution consisting of an Ethernet Gateway, 20 wireless water-detection sensors, and 5 temperature sensors. Each Monnit Gateway supports up to 100 sensors, which is why the company decided to extend their network of wireless monitoring coverage with heat sensors into the HVAC ducts for precision environmental control.

After a painless installation of Monnit's Data Center Remote Monitoring Solution, temperature sensors detected a potentially damaging incident when environmental controls weren't providing adequate cooling to one side of the server room. Fortunately, detection took place before critical damage could occur.

Ultimately, the company's cost-savings amounted to a newfound ability to prevent costly water or temperature damage, and to ensure its systems were functioning properly. That's the Monnit success story.

How the Monnit Solution Works

The Monnit solution consists of wireless sensors, gateways and monitoring software, to offer a complete remote monitoring solution. Wireless sensors can be used to monitor various environmental aspects of your business as well as integrate with your existing equipment (such as coolers and appliances) to give you real-time data.



Monnit wireless gateways act as a communication bridge between wireless sensors and the iMonnit Online Monitoring Software which allows you to view sensor information from anywhere, anytime through a computer, tablet or smart-phone.

iMonnit software can also provide immediate alerts via email or text message; it can also call your phone when predefined conditions you've set are met or exceeded.

Monnit's Wireless Sensor Network (WSN) can expand from a single local area to a multi-site network with sensors anywhere in the world, as long as the sensors are connected to a Monnit gateway. Monnit gateways then transmit data to Monnit's cloud-based software giving you the freedom to configure, monitor, and manage all of your locations from one network.

Monnit Wireless Sensors are making a big impact with many commercial property owners across the globe. Monnit systems can help you and your staff monitor various aspects of your business environment with multiple sensors in a single view.

- Save time and resources
- Protect your investments
- Enhance safety
- Greater operational efficiency
- Strengthen your workforce
- Protect your Reputation
- Extend the lifetime of your system
- Monitor from anywhere, 24/7

Today, the importance of convenience, flexibility, cloud-base, and mobile access to system data cannot be overemphasized. Voted one of 2016's Top 50 IoT Companies by CRN Magazine, Monnit Data Center Remote Monitoring Solutions keep track of Data Center activity from anywhere in the world, anytime, while securely logging data and providing immediate alerts when conditions exceed predefined thresholds.

Monnit has over 50 different types of wireless sensors, each with unique characteristics whose application will provide the solution you need. Interoperability is key, which is why Monnit also delivers a variety of gateway communication options, such as Cellular, Ethernet, USB and serial MODBUS to connect your devices with Monnit's cloud software.

Cellular, Ethernet and USB gateways are capable of connecting with up to 100 wireless sensors per gateway. Serial MODBUS gateways can connect with up to 50 wireless sensors.

Features and Benefits

- Easy set-up and use
- Reliable, proven technology
- Low-cost
- Low power/long life
- Exceptional wireless range
- 50+ sensor types
- Scalable / Expandable (100 sensors per gateway)
- Global RF frequencies
- Cloud-based monitoring software
- Text message, email, or phone call alerts
- 24/7 access from anywhere
- Custom sensors available upon request

As the most intuitive, reliable, and cost-effective solution on the market, Monnit Data Center Remote Monitoring Solutions provide environmental control when increased data traffic cannot afford operational compromises.



Monnit sensors can monitor and record important operational data in the software system 24/7, and data is accessible from anywhere, anytime via secure login through Monnit's Online Dashboard and mobile Apps.

If data center environmental control systems perform outside specified parameters, Monnit alerts can be sent to multiple contacts via text message, email, phone call, or even to a local warning system, to notify nearby employees.

This not only eliminates potential for human error, but also saves time and money while giving you visibility and control to ensure the integrity of your data, whether it resides in a large off-site center, internal server room or data closet.

Key Takeaways

- Proper manual processes and documentation are time-consuming, prone to human error, and resource-intensive.
- Monnit Data Center Remote Monitoring Solutions can monitor and track critical performance data, saving you time and resources.
- Significant energy-use savings can be realized by monitoring key Data Center performance indicators like power usage, throughput, temperature, airflow and presence of contaminants, water and humidity.
- Monnit Data Center Remote Monitoring Solutions can help you avoid costly losses and expenses.

"We would have never anticipated that an overflowing toilet could take down our server room. It's just not one of those things that seems possible. Prior to using Monnit, we had no way to detect anything other than temperatures. Now, we are able to detect numerous conditions that could cause problems, and I'm finally able to sleep stress-free, knowing the system will alert me the instant anything is wrong."

– Douglas G., VP Information Technology

About Monnit

Monnit bridges the gap between industry and technology through the Internet of Things, empowering businesses with easy-to-use, low-cost remote monitoring solutions. Monnit solutions can be used to remotely monitor a variety of "Things" (i.e. temperature, motion, moisture and humidity, energy use, etc.), alerting you by text, email, and/or phone call when user-defined conditions are met. Our goal is to save you as much time, money, and stress as possible, by preventing issues with inventory, infrastructure, and more.

As a Global Top 50 innovation leader in The Internet of Things (IoT), Monnit's technology has significantly expanded the frontier of both what and how "things" can be connected, monitored and controlled. It is almost impossible to identify an asset, process or solution, from SMB to Enterprise, indoors or outside, commercial to industrial, that cannot be uplifted by one of Monnit's 50+ reliable, affordable, tiny, powerful, wireless monitoring solutions.



For more information about our products or to place an order, please contact our sales department at 801-561-5555.

Visit us on the web at www.monnit.com.

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