Executive Summary
A wide range of vertical industries and enterprises rely on complex processes, systems, and equipment to keep operations on track. When failures or errors occur, the impact can be costly with negative effects on productivity, reputations, and revenue. The Internet of Things (IoT) is enabling a new era of connected intelligence, but many organizations cannot invest in brand new infrastructure and are concerned about adding security risks. Smart sensors and gateways offer an affordable way to garner IoT advantages without disrupting business models. They can help reduce or eliminate significant losses—whether of data, equipment, infrastructure, or uptime. Monnit offers an affordable, flexible end-to-end wireless sensor solution and Intel® architecture-based IoT gateways, bringing the considerable benefits of data-driven insight to today’s businesses.

Challenges
Data-driven decision making is now a competitive necessity for vertical industries from manufacturing and finance to healthcare and building management. Monitoring of equipment, infrastructure, and environments simplifies management, enables proactive maintenance, and can reduce workplace injuries and loss of valuable assets. But gathering essential intelligence from systems that are often incompatible and unconnected can be challenging and expensive.

Many deployments on established legacy infrastructure are currently unmonitored or monitored through a mix of vendor solutions. Often these solutions are based on costly wired sensors which cannot be easily altered or replaced.

Even in deployments of new infrastructure, IoT technologies can be complex to install and maintain, requiring compatible protocols and custom algorithms to take advantage of new levels of connectivity and enable cross-system insight.

Solution
Monnit is bridging the gap between industry and technology by empowering businesses with low-cost, simple sensor solutions. Designed to work in any environment, these solutions augment existing capabilities, rather than requiring rip and replace.

Monnit’s end-to-end IoT solutions include software, hardware, and services. Its low-power, wireless sensors and Intel architecture-based IoT gateways are used by a broad spectrum of industries for smart monitoring of anything—from buildings to data centers to healthcare and pharmaceutical facilities to food refrigeration. Solutions are easily integrated into existing infrastructures and legacy equipment, and are engineered to meet industry-specific requirements.
The ready-to-use, self-installable, wireless sensor solutions are designed specifically for commercial and industrial use. With Monnit, industries can potentially save thousands of dollars in damages to assets, inventory, and infrastructure.

- Remotely monitor a wide variety of variables (temperature, motion, humidity, vibration, etc.)
- Receive alerts based on user-defined conditions
- Develop a higher understanding of business processes and opportunities
- Help prevent waste and loss
- Help protect investments and assets

Monnit works closely with business decision-makers and managers to identify and prevent loss. The technology preempts loss of assets, inventory, and resources such as perishable goods (due to food spoilage or malfunctioning refrigeration units), critical medical supplies (due to unforeseen changes in temperature), and productivity (due to unplanned downtime created by enterprise data center lapses).

Data is collected from low-power wireless sensors; filtered and transmitted by an Intel architecture-based IoT gateway; and sent to a Monnit portal or to a third-party application hosted on Amazon Web Services® (AWS®). Near-real-time alerts and notifications can be accessed via the web, email, or text.

Data is gathered by wireless sensors, sent to an Intel architecture-based IoT gateway, and transmitted to the cloud for instant notifications and analytics

### With Monnit:

- **Vertical industries** can take advantage of intelligence generated by smart sensors targeted to address specific challenges and requirements. Industries retain control of their data and have the flexibility to use the analytics platform of their choice. Monnit is a business intelligence (BI) agnostic provider, offering analytics and back-end storage as needed.

- **System integrators** no longer have to piece together an IoT solution from multiple vendors or search for compatible sensors. Monnit offers complete solutions that simplify integration to bring products to market faster.

### Key Benefits

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<th>27 sensor types</th>
<th>27 different sensor types and more in development</th>
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| Remote monitoring | Remote monitoring with wireless sensors and Monnit’s online service  
Near-real-time alerts via text message, email, or voice if conditions indicate assets are at risk, including machinery, perishable goods, or resources |
| Exceptional wireless range | Optimized RF communications platform provides superior wireless range for large area coverage |
| Easy to setup and use | Set up takes just a few minutes  
Intuitive interface simplifies system management |
| Global RF frequencies | Wireless products operate using the 900 MHz frequency (868 MHz and 433 MHz frequencies will be available in late 2017) |
| Low cost | Affordable wireless sensors  
Free basic online sensor monitoring and notifications |
| Low power/long life | Exceptional power management  
10-plus-years powered by two AA batteries or one Industrial Lithium battery (5 plus-years when powered by one coin cell battery) |
| Easy installation | Monnit’s wireless sensor kits are ready to go out of the box  
No technical experience necessary to install sensor networks (simply place sensors in the desired location and turn them on) |
| Portability | If machinery is added or removed from a job-site, sensors can be installed on another asset, or stored for future use |
Monnit ALTA*

Monnit ALTA* products offer an enterprise-grade remote monitoring and control solution for global business. ALTA is a wireless sensor platform featuring 10 plus-year battery life and more than 1,000 feet wireless range (non-line-of-sight). Using frequency-hopping spread spectrum (FHSS) allows ALTA sensors to have better interference immunity. Security is maintained at all communication points from sensor to gateway, gateway to software, and back again.

• **Superior wireless range:** 1,000-plus-feet non-line-of-sight range through 12 to 14 walls
• **Long battery life:** 10-plus-years powered by two AA batteries or one Industrial Lithium battery (5 plus-years when powered by one coin cell battery)
• **Monnit Encrypt-RF* security:** Integrated bank-level security (256-bit exchange and AES-128 CTR on all messages)
• **Onboard data memory:** Store up to 512 readings per sensor; storage capacity allows for days, weeks, or months of time-stamped data logging
• **Future-proof investment:** Over-the-air (OTA) updates allow products to be updated remotely
• **FCC/CE certified module:** High-performing RF module for diverse enterprise IoT applications
• **100% comprehensive solution:** No additional hardware, software, or subscriptions required, plus no monthly fees

Security

Monnit intelligent sensors integrate bidirectional communication to continually confirm they are connected to a MonnitLink* Intel architecture-based gateway, and that data is safeguarded. The wireless protocol developed by Monnit protects against radio interference and spoofing of sensor data by third parties. Even in the event of a power outage or similar event that takes a gateway offline, the intelligent sensors recognize that a secure connection has been disrupted and enter a link state while waiting for power to be restored to the gateway. Only after reestablishing the connection with the gateway do they start transmitting data again.

Distributed intelligence at the gateway supports multiple communication options (e.g., serial, Ethernet, Wi-Fi, USB, and cellular). Monnit’s proprietary gateway communication protocol allows maximum performance with minimal bandwidth consumption. The newest addition to this protocol boasts a powerful 128-bit encryption engine.

Intel® hardware- and software-fortified security technologies create a chain of trust, from thing to network to cloud. Valuable data can be safeguarded against theft and tampering and only trusted data is analyzed to help protect, detect, and correct against attacks.
1. Place wireless sensors on or around “things” you want to monitor

2. Setup notifications for when certain “conditions” are detected

3. Receive real-time alerts by text, email or phone call, wherever you are.

**Learn more about industry use cases ›**

### Sample Use Cases

**Monnit sensor solutions are being used to prevent loss and increase business intelligence. Typically, sensor data is sent wirelessly to an Intel architecture-based MonnitLink* gateway. The gateway then sends the information to iMonnit*, an online sensor monitoring system, or to a third-party service hosted on AWS.**

#### Server Rooms and Data Centers

**Challenge:** A leak outside of a data center spreads water into the server room. This caused an electrical short, which took down several server stacks and damaged a handful of servers.

**Solution:** Monnit provided wireless water detection sensors, as well as temperature sensors to more closely monitor the control system’s environment. Notifications alert the IT staff if water is detected or if a fluctuation in temperature indicates an asset is at risk.

#### Pharmaceutical Refrigeration

**Challenge:** Monnit was contacted by a large biotech company when a pharmaceutical storage freezer quit over a weekend, ruining the entire stored inventory.

**Solution:** Monnit wireless temperature sensors were deployed in the company’s pharmaceutical freezers and refrigerators. Using a secure login, the company can now view and track temperatures for each cooling unit and print reports for compliance records. Timely notifications allow temperature-sensitive inventory to be moved to back up storage coolers and refrigeration units to be proactively repaired.

#### Commercial Building Management

**Challenge:** A large property management company sought to lower costs associated with managing and maintaining their properties without having to rely on staff being on premises 24/7/365.

**Solution:** Monnit provided wireless water detection sensors and temperature sensors to monitor HVAC systems. Notifications alert the property manager if water is detected or if a temperature falls too low.

#### Manufacturing and Production

**Challenge:** A product manufacturer had issues with personnel leaving their stations while equipment was running, causing premature electrical motor failures due to overheating.

**Solution:** Monnit recommended the use of wireless voltage detection sensors, temperature sensors with probes, infrared motion sensors, and an Intel architecture-based MonnitLink gateway. The sensors continually detect and track motor runtimes and check motor temperatures. A manager is notified if a machine is running when there is no operator in the control area.

#### Financial Services

**Challenge:** A large financial firm experienced a cooling malfunction over a weekend when the office was empty. This shut down servers in one of their data closets. The resulting downtime caused losses in business and reputation.

**Solution:** Monnit deployed wireless humidity and water sensors, along with temperature sensors in HVAC ducts, to more closely monitor the environment. Notifications alert the IT staff if anything falls outside of the preferred range.

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Monnit products are fully tested, FCC, CE, and IC compliant for use anywhere in the world. The company’s awards include recognition by CRN as one of the top 20 “coolest IT hardware vendors.”
**How it Works in Brief**

Monnit wireless sensors are battery operated (line-powered options are also available) and can be deployed anywhere—enabling businesses to leverage sensor data, protect resources, and save money. Unlike many existing solutions, the sensors are easy to install. Most systems can be configured in less than 15 minutes out of the box, and do not require professional installers or electricians. The sensors also maintain themselves: Automatic alerts show the percent of remaining battery power. At the server level, Monnit Mine* is an API designed to work with .NET* or Java*. Monnit supports Java and .NET/Windows* applications and can work with Linux* and other embedded operating systems on gateways.

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**Conclusion**

Monnit wireless sensors and Intel architecture-based IoT gateways allow enterprises and vertical industries to remotely monitor critical parameters via online connected devices. Now you can move forward with data-smart deployments and realize key IoT benefits with this complete sensing, data-tracking, and alerting solution designed for today’s demanding industries.

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**The Foundation for IoT**

Intel works closely with the ecosystem to deliver smart Internet of Things (IoT) solutions based on standardized, scalable, reliable Intel® architecture. These solutions range from sensors and gateways to server and cloud technologies to data analytics algorithms and applications. Intel provides essential end-to-end capabilities—performance, manageability, connectivity, analytics, and advanced security—to help accelerate innovation and increase revenue for enterprises, service providers, and vertical industries. Intel can help organizations use data to monitor, control, optimize, and benchmark, as well as to share historical and near-real-time information to improve decision-making.
About Monnit

Monnit Corporation was established to enable the emerging trend of connecting, monitoring, and controlling machines and other things in the environment. Whether organizations are looking for product customization, new product development, training on using sensors and monitoring systems, or assistance with system installation, Monnit is here to help.

The Monnit team consists of industry veterans and creative, energetic associates dedicated to providing the best products and service to its customers and partners.

monnit.com

Learn More

For more information about Monnit, please visit monnit.com, or contact us at info@monnit.com or 801-561-5555.

For more information about Intel IoT technology and the Intel IoT Solutions Alliance, please visit intel.com/iot.

Intel technologies’ features and benefits depend on system configuration and may require enabled hardware, software, or service activation. Performance varies depending on system configuration. No computer system can be absolutely secure. Check with your system manufacturer or retailer, or learn more at intel.com/iot.

Cost reduction scenarios described are intended as examples of how a given Intel-based product, in the specified circumstances and configurations, may affect future costs and provide cost savings. Circumstances will vary. Intel does not guarantee any costs or cost reduction.

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