

# Wireless Sensor Systems Simplify Intelligent Manufacturing





# Overview

As a plant manager or quality manager, you are constantly striving for more efficient production and output from your plant. You're on the lookout for the latest technologies and process updates that will improve yield and reduce the cost of production.

You need to minimize costs, while meeting (and hopefully exceeding) quality standards, but your current methods lack the insights you need to improve yield or quality.

With the day-to-day challenges of successfully running your plant, you can't afford avoidable downtime events. You need real-time data that not only improves your day to day operations, but also puts you ahead of the pack when it comes to the future of Big Data in manufacturing.

Most plants have been using the same quality control system for 10 years. Chances are, you've noticed that there's plenty of room for improvement.

Improved measurement capabilities and additional insight into KPIs with data analytics and software tools could take your quality control and production efficiency to the next level.

With the advances in sensing and wireless communications, there's a new way for the manufacturing industry to produce better products, operate more efficiently and keep costs down.

***67% of manufacturing businesses will prioritize gaining insights into equipment health for improved maintenance and 55% want to drive operational improvements and workforce efficiencies.***

***[GE Industrial Internet Insight Report for 2015]***

Wireless sensor systems can proactively protect and monitor equipment and processes through a low-cost, unified solution at 1/10th the cost of traditional industrial systems.

# What is the Industrial Internet of Things?

The key to understanding the solution of wireless cloud-based sensor systems is understanding the Industrial Internet of Things (IIoT).

In today's world, wireless internet is ubiquitous. Connected devices are showing up more and more in our homes and offices, in the form of smart security or climate control systems.

Technology companies are rolling out new versions of voice-controlled, smart devices all the time.

While the implications of the consumer Internet of Things might seem trendy or even spectacular at times, the Industrial Internet of Things is poised to transform not only individual manufacturing plants, but the entire world of manufacturing as a whole.

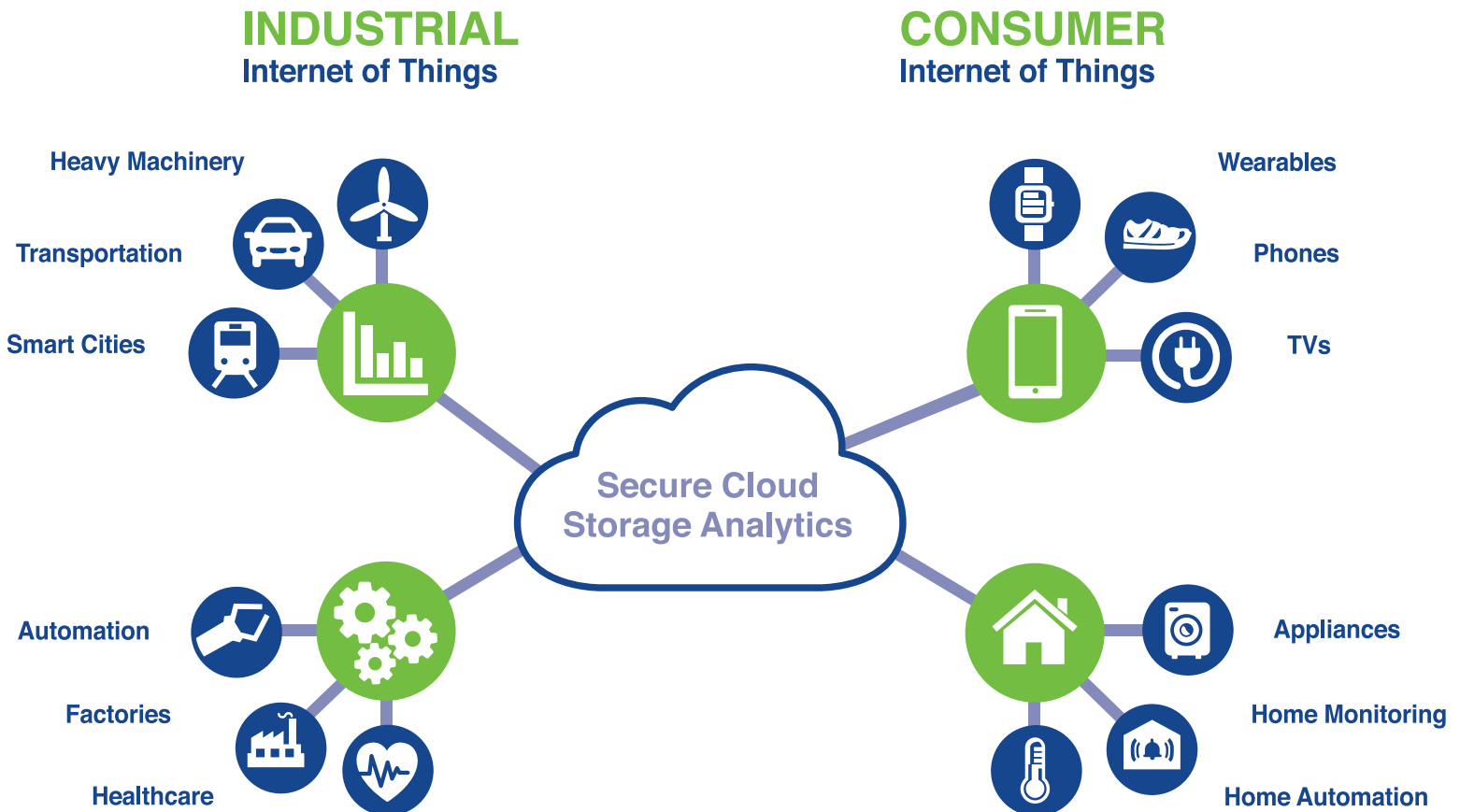
*Consumers, business and government will invest almost \$1.6 trillion in IoT solutions by 2020.*

*[PWC, The Industrial Internet of Things]*

The Industrial Internet of Things refers to wireless sensors and intelligent machines that collect data and integrate analytics into the operational processes and systems in an industrial setting.

The data generated by wireless sensors systems improve Overall Equipment Effectiveness (OEE) and are invaluable for QC/QA.

**Wireless sensor systems prevent unexpected downtime due to machine failure or other issues, and give plant managers and QA managers deeper insights into their traditional industrial systems.**





## The Future, Now

**Plants of all sizes and companies across the manufacturing industry have similar goals: produce great products and operate as efficiently as possible.**

Wireless sensors are a great way to add measurements and insights into production operations. A connected, wireless smart system can make meeting production goals and standards easier without replacing existing equipment.

Instead of overhauling existing industrial systems or facing downtime due to equipment replacement, wireless sensor systems offer the benefits of data collection and analysis, easy deployment and seamless integration.

*Companies that deploy IIoT solutions typically see a 30% or better reduction in hard operational costs related to asset, equipment and facility management.*

*[10 Things Leaders Should Know About IIoT - Autodesk, 2015]*



## Terms to Know

*New technology means new terminology. Go beyond the buzzwords with these core terms and concepts to better understand how wireless sensing can transform your business.*

### Wireless Sensors

Wireless sensors are small, connected devices easily affixed to existing equipment or deployed on the plant floor. These are a unique Industrial IoT solution that transform equipment and assets into "smart" machines.

**A wireless sensor system can monitor "vital signs" of a manufacturing operation.**

- **Temperature**
- **Humidity**
- **Motion**
- **Sound**
- **Pressure**
- **Vibration**
- **Water presence**
- **Flow**
- **Power**

At Swift Sensors, we use a plug-and-play, matchbook-size wireless sensors that transmit data via RF to a Swift Sensors Bridge. Each wireless sensor is powered by a coin cell battery. The sensors automatically connect to and securely communicate with the bridge, which securely transmits all sensor data to the cloud.

When power and cabling aren't accessible, monitoring physical assets can seem out of reach. Plug-and-play installation easily enables this and low-power design results in an expected battery life of 12 to 24 months, depending on the user-defined monitoring frequency.

# Cloud Systems and Cloud Security

Wireless internet makes it easy to deploy sensors to collect data and analytics, but where does all of that information go once it's harvested?

A cloud is essentially a data storage center for a distributed sensing system. The compute architecture processes and stores the sensor data with built-in redundancies.

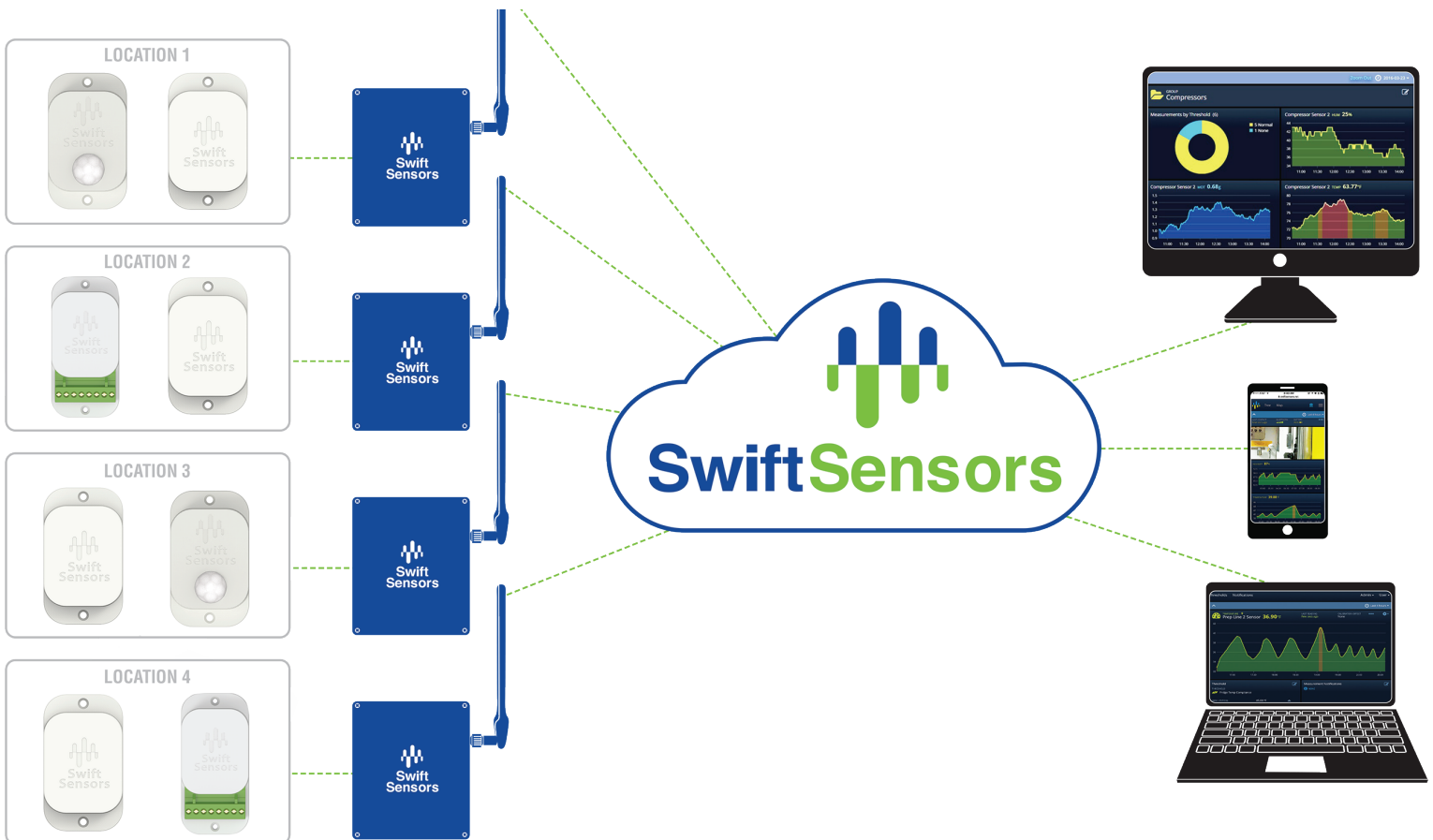
The Swift Sensors system is 100% cloud-managed. The on-premise bridge appliance securely transmits sensor data to the Swift Sensors cloud using 256 AES encryption for secure transmission of all sensor data.

The system is scalable from single sensor type, one-site applications through multi-site enterprises with 1000s of varied sensor types combined in one unified system. That means no extra time wasted piecing together end-to-end solutions.

Swift Sensors eliminates ongoing server, storage, and software maintenance; the sensor system is always up to date, regardless of project or enterprise size.

Security is always a concern when handling important data and processes.

The Swift Sensors cloud system is built by industry experts with extensive experience in keeping corporate networks secure. Built-in cyber security, with continuous monitoring and security updates delivered through the cloud, aims to avoid cyber-attacks as compared with more traditional systems designed to be on-site, and only later modified to connect to the internet.



# Dashboard

The dashboard is how plant managers can interact with the data and analytics collected by a wireless sensor system.

It's through this human interface with data and analytics that industrial IoT can improve operations, increase productivity and transform a business.

Plant managers use the intuitive dashboard interface to fine tune data collection to their needs, generate reports and gain valuable insights to operations and data trends. The Swift Sensors browser-based dashboard allows real-time remote asset monitoring and sophisticated analytics.

## Typical Dashboard Functions:

- View real-time and historical sensor measurements
- Set thresholds for measurements or groups of measurements
- Set notifications when thresholds are exceeded
- View sensor measurements by location
- Set and view % Utilization and % Compliance for Overall Equipment Effectiveness (OEE)
- Input conversion values for 4 -20mA current loop transducers
- Manage user profiles and permissions



# Understanding the Wireless Sensor System in Manufacturing

While the tech can be interesting, at the end of the day--it has to work on the floor. Results and real-world applications are the true measure of any innovation.

Wireless sensor systems and the industrial IoT offer real-time insights into assets, equipment, and processes, notifying appropriate personnel in a timely manner to act on the data and avoid problems or losses.

The powerful dashboard give access to deeper insights into overall equipment effectiveness through additional sensor monitoring that will improve yield, and lower costs.

Expert design and built-in cyber security with continuous monitoring and updates via the dashboard help keep data safe and focus on the core, value-adding benefits of a wireless sensor system.

In an industry where needs change rapidly and industry standards are constantly involved, this accelerated deployment and flexible customization can be a huge help in complying quickly and improving regularly.

With no wires to connect, no software to install and no technicians needed to deploy, the plug-and-play simplicity of Swift Sensors means you can get your new sensor system up and running the day its received.

## How Wireless Sensing Can Transform a Business

The Kraft Heinz plant in Champaign IL is a large facility producing some of the most popular foods in North America--Mac & Cheese, Miracle Whip, A1 sauce, and their large family of salad dressings.

The raw ingredients at the plant as well as the finished product must be kept at temperatures within strict tolerances. Additionally, the plant uses large numbers of compressors and motors to produce and cool their products.

*“One of our biggest challenges is we don’t get insight into our issues in a timely manner to take action to correct them.”*

*W. Thacker*


*Electrical Engineering Supervisor*



*Kraft-Heinz plant,  
Champaign IL*

Engineers at Kraft Heinz deployed a large wireless sensor system from Swift Sensors to monitor temperature and humidity in the temperature sensitive production and warehouse areas of the plant and vibration sensors to monitor motors and compressors. Swift Sensors now supply real-time monitoring to the plant managers and notify them if any of the temperatures or vibration exceed defined thresholds.





# Harnessing the Power of Wireless Sensor Systems

**Here are a few simple questions to determine if you could benefit from a wireless sensor system:**

1. Do you lack insight into the overall efficiency of your manufacturing operations, including machine utilization, equipment health, production yield, and energy consumption?
2. Do environmental variables such as temperature and humidity impact the quality and yield of your raw good, production, or finished goods, including storage and transport?
3. Are there measurements you can make on your equipment or in your facility to provide additional key insights into your operations?
4. Have you opted out of adding sensors to your existing control system due to cost and complexity of modifying the system configuration and updating the software?

If the answer to any of these is yes, you could benefit from a wireless sensors system. In many of today's manufacturing facilities, measurements that could give critical insights to operational efficiencies are not made due to the cost and complexity of updating the current machine or plant-wide control system, which are often more than 10 years old.

**Request A  
Demo Today**

# So What Is Needed To Deploy A Wireless Sensor System?

Using Swift Sensors as a model, there are four primary elements of wireless sensors system:

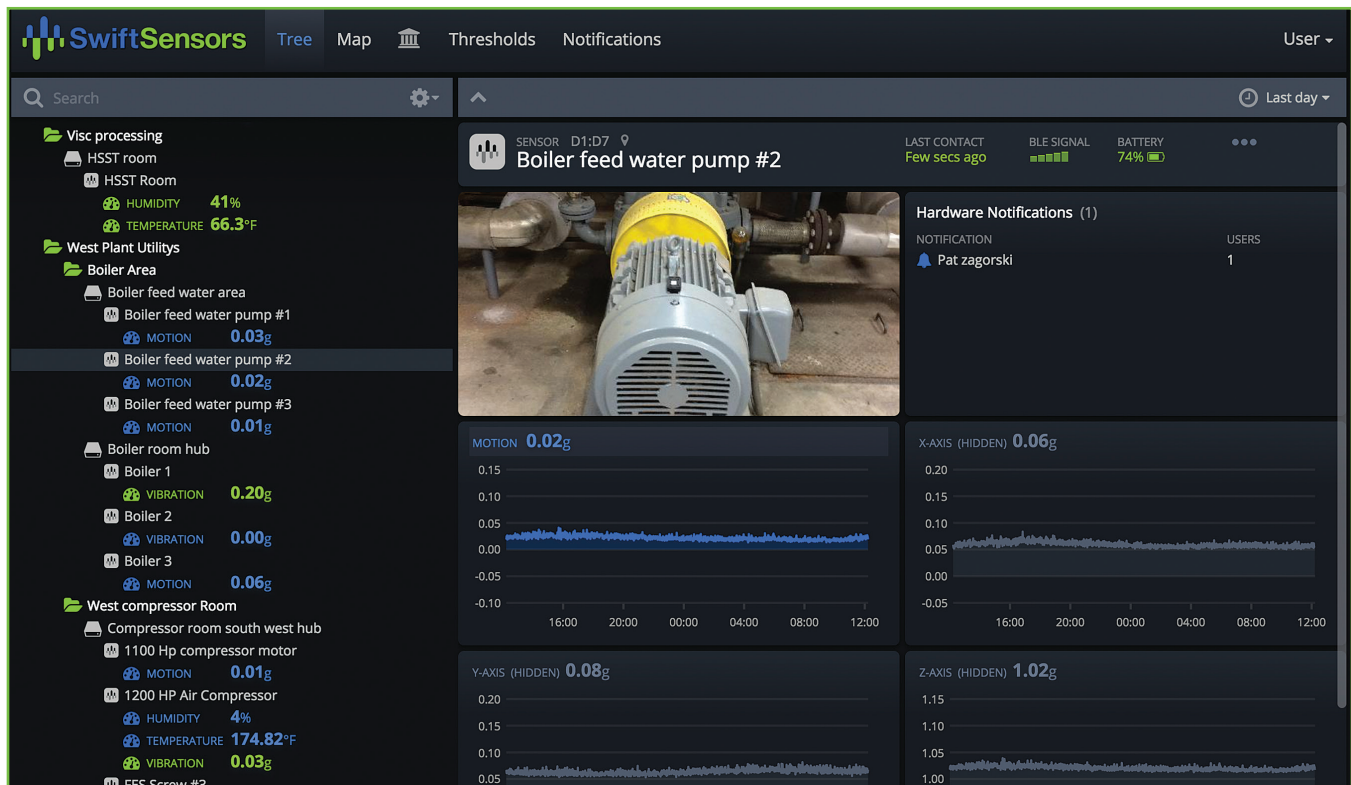
1. **Wireless sensors** to measure and transmit their data.
2. **Bridge appliance** to collect data from the sensors and transmit data to the cloud
3. **Cloud storage and processing** to store, aggregate, manage, analyze, and share data.
4. **Dashboard** to configure the wireless system, including thresholds and notifications, and to view sensor data stored on the cloud.

Selecting and deploying the system includes the following four steps:

1. Select and deploy sensors to monitor physical properties such as temperature, humidity, vibration, motion, voltage, and current (e.g 4-20mA).

2. Select and deploy a Bridge appliance to securely transmit sensor data out of your facility to the cloud using either wired ethernet, Wifi, or cellular.
3. Log-in to the Dashboard to name and organize the sensors and configure each sensor's sample rate.
4. Using the Dashboard, configure low and high thresholds, set notifications for thresholds out of range, and create custom views for display on computers, tablets, and smartphones.

After the initial configuration, the sensor system continuously monitors equipment and processes in the plant, notifying personnel when something needs attention. Data from the system can be exported in standard CSV format for reporting and can also be shared with other applications (e.g. ERP or Data Analytics) using standard RESTful APIs.





# About Swift Sensors

Swift Sensors is a cloud wireless sensor IoT company, providing a low-cost, unified sensor system for industrial and commercial applications. Founded in early 2015, Swift Sensors brings together the technology advantages of cloud and wireless technology in a unified, globally scalable sensor system.

Its flagship product is the Swift Sensors Cloud Wireless Sensor System, comprised of a comprehensive line of low-power wireless sensors and cloud-based monitoring, alerts and analytics in a unified solution.

The sensor system enables companies to proactively protect and monitor a wide range of equipment and processes, comply with regulations, and enhance business performance. Swift Sensors applications include food chain, transportation, restaurants, industrial, IT data centers, research & development, and power.

## Get in Touch

**Ready to see a wireless sensor system in action?**

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