SIMPLE STEPS - BIG REWARDS

Gaining a Competitive Advantage with Wireless Sensors in Manufacturing

PHASE IV
ENGINEERING INC.

Introduction

There's been lots of talk in recent years about the "Industrial Internet of Things", "Industry 4.0", "Digital Transformation". Corporate leaders are adopting sensor technologies as both a high-value product differentiator for their customers and a signal to shareholders that they are a leader in their market.

However, not all IIoT projects need to be large-scale, company-wide or plant-wide initiatives. In manufacturing industries, expensive equipment won't be replaced until it's at the end of its life, and a full digital transformation can be a long & costly process. Dramatic technology improvements in wireless sensor technology, combined with a change in perception about wireless devices, is fueling high growth of wireless sensing across the entire industrial sector. This is an opportunity for manufacturers where installing a wireless sensor system on existing critical equipment can quickly improve efficiency and gain a competitive advantage.

Table of Contents

Technology Shift in Wireless Sensing

In the past few years, improvements in wireless sensor technology have had a disruptive effect on industrial processes.

OLD PERCEPTION

NEW REALITY

- "Batteries wear out & we'll either be constantly replacing them, or we just won't bother anymore."

- Developments in long-life batteries & low-power transmitters mean sensors can last for a decade - often way beyond a machine's expected life - making them practically battery-free™.

- "Concrete walls, metal machinery - our factory environment creates too much 'noise' and interferes with transmissions."

- New standardized wireless communication protocols make long-distance transmission in industrial environments reliable.

- "Installation & set-up of wireless sensors is too complicated."

- The development of simplified wireless protocols and user interfaces streamlines installation and maintenance of a wireless sensor system.

- "My IT/OT department will have a fit over data security - and we don't need new cloud-based software to manage the system."

- Modern wireless sensor systems use the same internet protocol and security measures that IT managers advocate.

- "Our plant has specific needs - commercial off-the-shelf sensors just wont meet those needs."

- Breakthroughs in sensor design mean that adapting a sensor to unique parameters is easily done.

Perception Shift in Wireless Sensing

Many experienced automation controls engineers and manufacturing managers are hesitant to implement wireless sensors because of very real problems with the deployment of early wireless systems. This situation is similar to the first generation of wireless telephones. These early wireless phones were not reliable, caused frustration, and many people went back to wired phones.

Wireless technology has improved to a point where the younger segment of the work force never has had a bad experience with wireless devices--and they expect to use of wireless communication in the products they buy at home and at work.

And from the other side of the generational divide, workers with two or three decades of knowledge about the manufacturing equipment they work with are ready to retire, taking their expertise with them. Wireless sensors can help replace this "brain trust".

"It can be assumed that any new hires coming into the industrial ecosystem are all but digital natives, and have an expectation that their place of work will be digitally enabled."*

What's the Best First Deployment for Wireless Sensors?

We often see that the hardest step in the adoption of wireless sensors is the first step. The key to success, and upper-level buy-in, is choosing an application that involves minimal risk and effort, so that a high ROI can be quickly achieved. We recommend looking for an application that can't be solved any other way EXCEPT with wireless sensors. The idea is: how can you argue with trying an easy-to-install wireless sensor on something that you don't currently have instrumented - but could be invaluable if it worked?

Here are some applications where our clients have had success:

● **Predictive Maintenance**

Machine parts tend to heat up, vibrate, or draw more electrical power as they approach their failure point. These indicators can be used as signals for maintenance. Maximize machine life by allowing it to run for as long as possible, but also allow for scheduling planned downtime. Avoid critical - and costly - failures in the middle of a run.

● **Remote Equipment**

No high-cost conduit and wiring runs. Simple monitoring of equipment outside the plant, away from the control room.

● **Automate Auditing**

Besides being more efficient, data is automatically recorded and organized, and immediately accessible for oversight. Take fast corrective action.

● **Monitor Older Equipment**

New wireless sensors can be quickly retrofitted without adding new wiring. See dramatic improvements in monitoring the machine & reduce unexpected line stoppages.

● **Rotating & Spinning Equipment**

Rotating equipment is often some of the most vital pieces of equipment - and often the most susceptible to failure. Now get "x-ray vision" for equipment that couldn't be monitored with wired sensors.

● **Safety**

Wireless sensors can continually monitor high temperature equipment, moving equipment, and other parts of the process that are dangerous to check without stopping production. Make your plant safer.

Choosing the Right Sensor Technology Partner

Deciding a best first deployment is the first step. Next, finding the right partner with expertise in wireless sensor technology is critical to the success of the project. Here are some factors to consider.

✓ How long has a potential partner been involved in designing wireless sensor networks? Make sure your partner has the experience to have seen hidden issues.

✓ Are the sensors "one size fits all" or can the be adjusted to meet your specific needs?

✓ Is the system more about the "bells & whistles" or will the company work with you to find out the problem you specifically want to solve?

✓ Can the sensors connect to your existing software system, or is there only cloud-based software available?

✓ How much data is reported (and stored)? Make sure you're not getting overwhelmed with readings and can focus on actionable data.

✓ How is the system updated? Are over-the-air updates included? Make sure that maintaining the technology and security of your sensors isn't more trouble than it's worth.

✓ What does the installation process involve? Look for a system that isn't too complicated to set up.

Finding the right partner with expertise in *wireless* sensor technology is critical to the success of the project.

Conclusion

As Steve Jobs said, "Innovation distinguishes leaders and followers." We at Phase IV Engineering see possibilities for huge gains in efficiency and performance for manufacturers who integrate wireless sensing.

**Better Design.
Better Data.
Better Decisions.**
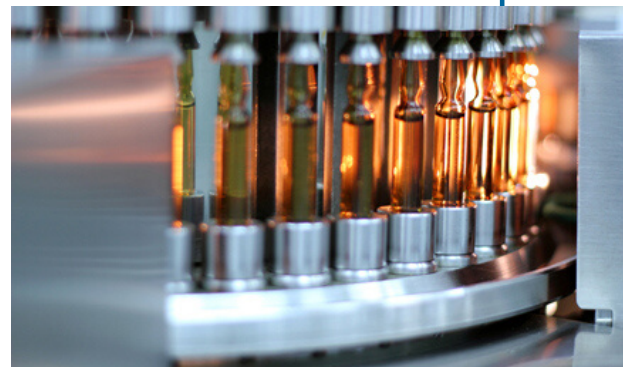
✓ **Talk to a wireless sensor expert today.**

Learn More

About the Leap Sensors System

Installs in Minutes

Easy to retrofit existing equipment: be up & running in 5 minutes. No wires to pull. Newly installed sensors add themselves to monitoring system.

Complete Solution - Completely Configurable

The ONLY end-to-end solution designed specifically to integrate easily into industrial applications. Configurable sensors, rugged enclosures for extreme temps, edge computing, software interface that meets your needs.

Solving the Toughest Sensing Problems

Strain, load, high sample rate vibration with edge computing, multiple sensors (of different types) on 1 sensor node.

State-of-the-Art Security

Data is encrypted at the sensor level and stays encrypted to the final database. Use the same protocol banks use for their financial transactions..

Easy to Integrate

Seamlessly communicates with your current software or PLC. No need for separate cloud-based software.

Advanced, Configurable Design

Breakthrough modular design makes it easy to adapt a sensor to your specific needs.

Motor Monitoring

Breakthrough wireless motor monitoring sensor continually monitors the top 3 predictors of impending failure: motor temperature, electrical current draw, and vibration. Receive alerts of warning signs before equipment failure & avoid costly downtime