

# WIRELESS NOW

## THINK BEYOND THE WIRE

INNOVATIVE FIRST MOVERS GAIN A COMPETITIVE  
ADVANTAGE, EVEN AS THE LAST BARRIERS TO  
WIDESPREAD ADOPTION FALL

### WAYS TO PUT WIRELESS TO WORK TODAY

MEASURE AND GATHER  
NEW PROCESS DATA

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BOOST YOUR  
WORKFORCE PRODUCTIVITY

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**PLUS: BENEFITS OF WIRELESS  
FOR THE FOOD & BEVERAGE  
INDUSTRY**





# Benefits of Wireless for the Food & Beverage Industry

Growing wireless automation portfolio helps deliver benefits for food & beverage companies

**FOOD & BEVERAGE** manufacturers face an increasing challenge to respond quickly to consumer demand for a growing range of exciting and innovative products. Production flexibility and the ability to extend or modify an existing plant are becoming critical to success. It is therefore hardly surprising that the industry is evaluating wireless technology for industrial networking applications, due to its inherent ability to accelerate installation and commissioning.

Although wireless technology has been around for some time, its adoption has been relatively slow because it was believed to be difficult to install. This has proved to be the case for some solutions, particularly those that require direct line of sight between devices and therefore involve a time-consuming site audit prior to installation. However, with the introduction of self-organizing wireless mesh networks, such as Emerson's Smart Wireless, this problem has been solved.

Smart Wireless combines highly reliable, intelligent monitoring devices with wireless transmitters, networked together using Time Synchronized Mesh Protocol (TSMP) communications technology. This is designed and tested to be tolerant to almost all interference and can coexist with other wireless networks in the plant.

As new devices are added, they connect automatically to the self-organizing network. Where necessary, devices pass their messages on via other wireless devices until they reach the gateway. Extensive site surveys are unnecessary and each device is ready to connect when installed. If something disrupts communication between devices, the self-organizing network recognizes the problem and automatically re-routes communications along the next best path. This results in a communications reliability of greater than 99%. Built-in encryption, authentication, verification, key management, anti-jamming and other security measures can make properly implemented wireless networks as secure as traditional wired ones.

According to John Berra, president of Emerson Process Management, "In my 39 years in process automation, I have never seen a technology with such compelling, immediate benefits. Wireless simply means a better way to put more eyes and ears in the plant, to enable the plant to run better, safer, and greener."

Customers are evaluating wireless for both existing facilities and greenfield sites. While many installed instruments have embedded intelligence with the potential to deliver valuable diagnostic information, process control systems have traditionally lacked the infrastructure to

successfully extend and manage the flow of information around the plant. The process of transferring data, for example, via hard wired communications protocols to a PLC, can prove technically challenging, or physically or economically impractical. Wireless overcomes these issues, enabling access to remote or inaccessible locations.

Emerson's Smart Wireless technology passes data efficiently to a gateway and delivers it to the automation system. For existing installed wired devices, the Emerson Smart Wireless THUM Adapter provides the opportunity to transmit otherwise stranded diagnostic information back to the asset management system. As a result, personnel can take speedy corrective action and maximize the potential of their production assets.

The low cost and high speed of installation of wireless creates new opportunities to optimize plant performance.

**“We see a number of opportunities to implement wireless.”**

*—Martin Friz, Ziemann Group*

By collecting stranded diagnostic information, or adding new measurement points at previously inaccessible or cost prohibitive areas within a plant, wireless can be instrumental in reducing variability within the overall production process. This can result in improved end product consistency, reduce product losses, or avoid the need for expensive re-work.

“We see a number of opportunities to implement wireless,” suggests Martin Friz, Director Sales Automation of global brewery process engineering supplier Ziemann Group. “For example, some breweries extend over a large area resulting in process phases, such as fermentation, being remotely located. It is important to strictly control temperature in the fermentation tanks. Wireless temperature measurements applied at different levels within the tank will ensure that the temperature is monitored throughout the batch, with alarms transmitted to the control room in the event of deviation.”

#### PLANT MAINTENANCE

However, measuring process parameters is not the only application for wireless; it can also be used to improve maintenance. Since unscheduled downtime of any filling and bottling operation results in lost production, and possibly expensive emergency labor, it is important to track the condition of bearings and transmission trains. Machinery health data is typically tracked every 2–4 weeks as part of a predictive maintenance program. By contrast, wireless vibration sensors can provide a continuous real-time indication of equipment reliability every day, not just once a month, and offer enhanced protection against failure. The data is consolidated into customized reports in AMS Suite predictive maintenance software to

show the condition of critical components.

The use of wireless networks can also be very effective for applications in older food and beverage plants, where wiring diagrams can be difficult to locate and/or are hard to decipher. It can be a problem to identify spare capacity within existing wiring runs or to be sure that the wiring is in good condition. If it is determined that additional wiring is required to accommodate further devices, wireless can offer a quick, cost effective solution due to its scalability and ease of installation. Apart from the obvious cost associated with wiring, there are additional engineering expenses incurred for planning and installation, especially for plants in remote locations where travel and work permits for expert resources may be involved.

#### TROUBLESHOOTING

Wireless also provides a flexible solution for process troubleshooting. In some cases, it can be difficult to detect the reason for a deviation within the process that is leading to wasted or spoiled product. Due to its easy installation, wireless instruments that measure temperature, level, pressure, or flow can be temporarily deployed within the process to help detect where the deviation is occurring. Once the problem is rectified, the same instruments can be removed for re-use as required.

Wireless can also be used on a temporary basis for troubleshooting during the final stages of bringing the plant on line. For example, measurements can be taken at certain points within the process to help diagnose problems. This saves valuable engineering hours, and accelerates final commissioning.

Plant utilities, such as the boiler and compressor are frequently remotely located and, in some cases, physically very difficult to reach with wiring. With ever increasing costs for energy and other valuable resources, it has become increasingly important to measure and monitor these as accurately as possible. For example, accurate measurement of the natural gas flow to each boiler is used to optimize boiler efficiency, whilst available steam pressure supply at the boiler enables boiler loads to be balanced and reduces the risk of unscheduled process shutdown. Steam, air, and ammonia gas flow are also measured to allow performance efficiencies to be evaluated.

The ability of wireless technology to transmit key data measurements at short, regular intervals represents a quick, cost effective, and accurate alternative to data measurements recorded manually by employees using a clipboard. With all these advantages and a clear ROI, it is not surprising that plants are evaluating a wireless alternative.

Phil Niccolls, vice president of Food & Beverage Industry Sales & Marketing at Emerson Process Management said, “Some of the major food and beverage companies are rapidly embracing this technology for a

wide range of applications. Clearly, they are seeing the benefits.”

Emerson’s Wireless SmartPack Starter Kit, which comprises from 5 to 25 wireless devices plus a Smart Wireless Gateway, provides the ideal opportunity to test the technology and identify potential applications for a specific plant. Emerson’s Smart Wireless range of Rosemount pressure, flow, level, temperature, Rosemount Analytical pH, and CSI vibration transmitters and gateways are available with *WirelessHART* standard communications. The analyzers and other field network devices connect seamlessly with Emerson’s DeltaV and Ovation® digital automation systems, and AMS Suite. Customers can incorporate AMS Suite with new or existing PLC solutions.

#### FLEXIBLE SOLUTION

When constructing new plants, in order to build in flexibility, many equipment suppliers allow spare capacity for future plant expansion within the initial plant design. As wired systems are expensive to modify at a later date, extra wiring is likely to be installed



up front. Due to market fluctuations, this additional capacity may end up by not being used and it can therefore represent unnecessary expenditure. The availability of wireless technology means that this investment is no longer necessary. As Emerson’s Smart Wireless field networks comply with the self-organizing mesh specification of the interoperable *WirelessHART* industrial standard for process industries, they are designed for future scalability. This allows for the addition of other wireless transmitters that will instantly connect to the existing wireless network.

Wireless is ideally suited for applications that require slower, but regular updates, ranging from a few seconds to several times per day. For example, wireless can provide a practical, cost effective option for connecting remotely located equipment, such as those monitoring emissions or utilities. Due to a growing need for environmental compliance and spiraling costs of energy, the ability to install additional devices to measure and monitor the use of valuable resources is a great advantage.

Additionally, many areas within a food and beverage plant tend to attract moisture, which can provide a breeding ground for unwanted bacteria. As it is difficult to effectively clean wiring within these areas, a wireless solution provides a cleaner environment to help maintain the highest levels of hygiene and avoid product spoilage.

With rapidly changing consumer tastes, it is essential to have production lines that are flexible and easy to modify. By implementing a self-organizing wireless infrastructure, it may be possible to modify the plant layout without having to lay new cables or undertake site surveys. For example, when portable skid mounted units are moved from one part of the plant to another, wireless enables them to be reconnected in their new position without the need for rewiring. This allows production to be restored more quickly, thereby increasing throughput.

Remotely located production facilities also put pressure on plant operations personnel. In a large plant, it can be necessary for staff to work far from their control rooms. This adversely impacts productivity, not only because of the time consumed to cover the considerable distances involved, but also because it will not be possible during this timeframe to access critical production information. By providing remote access to control and asset management systems, wireless PCs can greatly enhance efficiency and help plant operations staff to interpret what they see and quickly take corrective action. The ‘mobile worker’ staff will also be able to acknowledge and react to alarms from wherever they are in the plant.

As the potential of wireless becomes increasingly obvious, food and beverage manufacturers and their suppliers are showing a growing interest – a study by ON World into the application of wireless technologies within the process industries identifies food and beverage companies as being a leading adopter. The advantages it delivers of reduced cost combined with quick installation over such a broad spectrum of applications, for plant upgrade or greenfield developments, promises much for the future.

# PAIN ~~WIRELESS~~ INSTALLATION.

Smart Wireless puts money in your pocket and time on your side.

There's no reason new technology should be difficult or expensive to install. That's why Emerson Smart Wireless is designed to go from box to fully commissioned in minutes — at savings of up to 90% of traditional installed costs. You won't need complex engineering, specialized training, cabling, cabinets or panels, because to your staff, a Smart Wireless device is just like a wired one — only much easier and less expensive to install. In fact, the installation gets even simpler as the devices automatically find each other to form your self-organizing wireless network. It's easy, cost-effective wireless. That's Emerson Smart Wireless.

**WirelessHART** Discover your plant's limitless potential at [www.EmersonSmartWireless.com](http://www.EmersonSmartWireless.com)

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