

In focus: Wireless instrumentation

Making a smart wireless decision

Wireless networks have become an essential part of communication in the last century. From the internet to mobile phones, this invisible technology is now one of the world's favourite buzz words.

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WHILE consumers and commercial users tend to take immediate advantage of wireless technologies as they become available, industrial users have historically been a bit more cautious. This caution is generally due to concerns related to critical infrastructure security and reliability. However, if the right wireless solution is chosen, early adaptors of industrial wireless technology can have the best of both worlds – security and reliability while leveraging the efficiency and benefits of wireless technology.

The decision to implement wireless technology in an industrial facility is a strategic choice. So how can industrial plants truly begin to make sense of this new wireless world and choose which wireless solution (if any) is the right one for them? The answer can be found by asking the right questions.

Single vs. multi-purpose

Is a single strategic network or are multiple wireless networks best for your facility? While single-purpose networks may appear to be the most cost-effective approach for the first deployment, this is rarely the case. Very few plants ultimately use wireless technology for only a single task. A multi-purpose network that handles multiple functions is typically about the same initial price and will yield greater efficiency.

Many operators might want to consider open-loop control for non-critical assets in the future. It is far easier to take a wireless system capable of doing simple control and use it for monitoring and alerting than the



Wireless-enabled solutions are more than just avoiding the cost of a wire – they also turn valuable data into knowledge, helping plants keep their people, plant and environment safe and improving plant and asset reliability.

opposite, taking a monitoring network and trying to use it for control.

Do you want field workers with wireless handheld devices to be able to access data and interact with servers in the facility? Because field workers and first responders typically communicate via Wi-Fi networks, the industrial wireless network could jam during a plant emergency if it is not Wi-Fi compatible. Therefore, if you plan to enable field workers at some point in the future, it would be a good idea to select a compatible network.

Multi-speed support

Do you need information to reach the control room quickly for some applications and less quickly for others? Can you afford to have your alarms transmitted back at the same rate as monitoring information? Some measurements require fast responses while others can endure a slower update rate.

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ports a fast speed, the slower applications can unnecessarily consume battery life and bandwidth. On the other hand, slower-speed networks may not provide sufficient reporting for more critical applications. In general, it's recommended to ensure your network can support multiple reporting needs.

Reliability check

How reliable is your network? Is it important that the data is available

within the scheduled update time, or are data timeliness not important? Different applications have different requirements. To ensure future flexibility, plants should look for a system that not only has industrial-grade uptime, but one that does so with predictable, sub-second latency. One should also make sure the system can recover from RF path failure or hardware failures.

Security matters

Security is essential to protect against malicious intent and to safeguard your people, intellectual property and your bottom line. Security should be simple to deploy, easy to maintain and offer multiple layers of protection.

What type of security do you need? Consider the location of the plant, potential harm that could come from a security breach and the criticality of the data. For systems that require high security, a system should offer strong encryption, robust authentication and layered protection from attack. It is important that the system offers end-to-end security, meaning that data is not decrypted until it reaches the wired network.

Quiz your vendors and implementation team about how security is integrated into the system design and architecture. Security is only as good as its implementation, so make sure that the system you purchase has been tested and validated by credible third-party organisations.

Power management

When most users consider wireless deployments, they focus on the cost advantage and the absence of wiring, but they also envision the downside of changing batteries in devices throughout the entire facility. How long do you want your wireless devices to be



Wireless solutions are designed to make data easier to access and to help plants to be more safe, reliable and efficient.

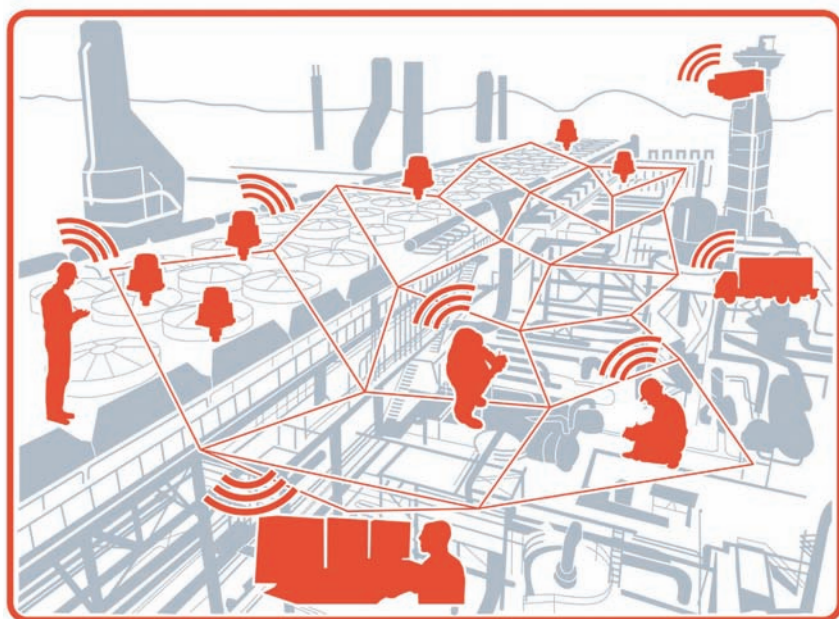
If implemented in the correct way, wireless technology can deliver long-term benefits that directly impact a plant's efforts to improve safety, optimise the plant and ensure compliance.

self-powered? The maintenance expense of swapping batteries should not negate the cost savings of less wiring. Generally speaking, plants should ask for at least a three- to five-year battery life. Make sure that your vendors specify battery life at a specific and reasonable update rate. One update every five seconds is a good benchmark for comparing battery life under general usage.

What level of a predictable maintenance schedule do you require? Certain wireless designs consume battery power at a very deterministic and predictable rate, allowing for scheduled battery replacements. Other designs may consume batteries in a non-deterministic manner, eliminating the ability

your wireless network serve? Wireless goes beyond supporting legacy devices. Companies also need flexibility to support future protocols that might not exist in the plant today.

Typically, plants contain multiple application interfaces driven by various departments. Many users also want information coming from their wireless devices to utilise these existing legacy applications and protocols. When selecting a strategic wireless network, you must have the ability to easily interface with all your legacy applications that will require wireless data. This is crucial because this network will service your overall operation, not just one department.



Do not fall into the trap of considering only your immediate needs. In order to allow flexibility for the future, make sure you select a system that can easily scale to thousands of devices.

ty to schedule battery changes in advance. In order to keep maintenance expenses low, select systems with predictable battery consumption.

Scalability

How many devices can your network handle? Do not fall into the trap of only considering your immediate needs. In order to allow flexibility for the future, select a system that can easily scale to thousands of devices.

How scalable do you want your network to be? For operators who want to start small and grow, it is important that the system selected is scalable enough to meet future requirements. Some systems can grow very large with minimal performance impact, while other systems quickly degrade after a small number of devices.

Investment protection

How many application interfaces can

Standards-based

Does the network support the important industry standards? In order to make sure the system can leverage industry standards, select a system that uses the ISA100.11a standard for sensor and field I/O communication, and 802.11 for device communication.

Ready for the future

Can the system be easily upgraded in the future? Does it support multiple radios? Wireless systems will continue to evolve and improve in the future. In order to protect your investment, select a system that can be easily upgraded via software and one that supports different types of radios.

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