

5 FACTS YOU SHOULD KNOW ABOUT WIRELESS I/O

Learn the keys to achieving secure, reliable, cost-effective wireless solutions for industrial automation applications.

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Wireless solutions for industrial automation applications are in high demand as companies look for cost-effective, feasible ways to implement secure, reliable data communications. Many markets, such as oil and gas, utilities and manufacturing are searching for ways to streamline operations and automate processes. Here are five facts you should know about implementing wireless I/O solutions.

1. The basis for wireless I/O is Frequency Hopping Spread Spectrum (FHSS) technology. FHSS technology helps transceivers successfully deliver secure I/O data, despite competing signals from other devices.

FHSS technology varies the carrier frequency throughout the spectrum in a pattern recognized solely by the transceivers assigned to communicate with one another in the network. This technology is particularly well suited for sending small packets of information, such as I/O, in a noisy, high interference environment.

Devices also can be equipped with external antennas, allowing radios to be mounted within a few feet of an obstruction, sending and receiving signals via antennas above the obstructions or interference.

2. The combination of spread spectrum wireless radios with I/O expansion modules offers increased scalability and performance for programmable controllers. Some providers of wireless I/O now offer expansion modules with an extremely high density of I/O. This allows users to install a small set of I/O in a critical location up front, knowing that more can be added at any point in the future.

Expansion modules are connected directly without additional mounting hardware, allowing up to 192 I/O points at a single location easily.

Adopting an expandable platform often is justified by additional monitoring mandated by the government, new process technologies that require more points for monitoring and control for higher process output, and for peace of mind knowing that more points can be added easily no matter what the future brings.

Wireless I/O also can integrate directly into a larger wireless SCADA network to connect the corporate office with field controllers, process measurements and control points. In addition, process security is enhanced with proprietary FHSS wireless technologies.

3. Wireless I/O delivers a cost-effective method to monitor and optimize a process that spans between 100 feet and 100 miles. Wireless I/O removes the enormous challenge of running cable from the point of measurement or control to the process controller. As a result, companies cut costs by eliminating cables and

conduits, trenching and construction crews, and permits. Costs also are reduced over time with quick troubleshooting, over-the-air configuration changes and upgrades, and by eliminating cable management activities.

Deploying additional points in a wireless I/O network is incremental. Instead of installing spare conductors, additional I/O slaves can share a common I/O master. Capacity is increased as required by simply installing additional I/O slaves. In effect, this is a “pay-as-you-go” architecture instead of a difficult trade-off between initial cost and installed spare capacity.

4. New wireless I/O products provide more measurement and control for process optimization and asset condition monitoring with less effort. In process industries such as oil and gas, chemical, food and beverage, electric power/smart grid and water wastewater, it's rare to see processes that rely on human decisions and manual interaction. This is because relying on human judgment and reactions introduces variability in reliability, timeliness and quality.

From a customer's perspective, variability reduces the perceived quality of a service or product. From the organization's perspective, variability creates significant challenges in growing revenue, capping expenses and maintaining consistent quality of service.

FHSS technology helps transceivers successfully deliver secure I/O data.

The newest I/O products provide more data with less work, including scalable digital input, digital output, analog input and analog output capabilities. This enables users to be more efficient by having a multitude of control and monitoring options for each device. New devices also enable communications via a Modbus host.

In addition to wireless and expandability, features such as universal channel configurability, measurement accuracy, device reliability, backwards compatibility and ease of use also enhance the usability of new I/O devices. New I/O devices should deliver a single, simple product to install and use for process applications.

5. No communications system is immune to signal loss. However, some wireless I/O systems send automatic communication alarms to inform users if a link is lost or interrupted.

In addition, some wireless I/O providers, such as FreeWave Technologies, have fail-safe-enabled functionality that, in the event of a communication failure, will allow the wireless I/O module to control outputs based on the preprogrammed fail-safe default configuration.

Data From Dispersed Assets

Wireless I/O solutions using secure industrial grade technology offers an opportunity to turn more information into knowledge across geographically dispersed assets, leading to optimized productivity, improved safety and asset reliability.

In addition, wireless I/O provides improved leverage of existing infrastructures, allows for better resource optimization, and gains relief from the current budget crunch in order to build a strong foundation for future growth. □



FreeWave Technologies, Inc., based in Boulder, Colorado, is a participating Encompass™ Product Partner in the Rockwell Automation PartnerNetwork. FreeWave supplies high-performance license-free and licensed radios.

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FreeWave Technologies Inc.'s wireless I/O solutions work with Rockwell Automation programmable controllers to create a unique way to address issues previously deemed cost-prohibitive, not technically feasible or lacking in sufficient reliability.

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