

CHOOSING A WIRELESS IMPLEMENTATION STRATEGY AND APPLICATIONS

Sachin Gupta, Sr. Wireless Consultant

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1. INTRODUCTION

The value, impact and criticality of wireless are enormous. Therefore, it is essential that industrial plants define, implement and adopt a wireless strategy. An effective industrial wireless solution requires a combination of numerous wireless standards and technologies. This white paper outlines the considerations that end users should address when planning and implementing a wireless strategy.

2. KEY CONSIDERATIONS BEFORE SELECTING A WIRELESS SOLUTION

Modern process industries thrive on improving ROI. These industries are highly complex, cost sensitive and time-to-market driven. Since production and operational efficiency are key success factors in achieving these ROI goals, the process industries strive to raise customer satisfaction, increase employee productivity and streamline store operations.

In many cases, though, productivity can be slowed or even halted because of a lack of visibility into the location and status of inventory, assets and even people. In these environments, not knowing the location of critical assets or being unable to locate the next piece of work-in-process inventory can mean delays of hours and direct costs of tens or even hundreds of thousands of dollars. Instant communication effectively improves visibility into all of these areas. A wireless solution can help to facilitate real-time communication.

The benefits of wireless technology fall into two main categories: core business benefits and operational benefits. Core business benefits include improved employee productivity, quicker and more efficient business processes and the greater potential for creating entirely new business functions. Operational benefits include lower costs of management and lower capital expenditure.

Because of the value, impact and criticality of wireless, it is essential for industrial plants to define, implement and adopt a wireless strategy. Described here are the considerations that any company should analyze when implementing and planning a wireless strategy.

Analyzing Business Needs and Applications. Without appropriate, usable applications, a wireless device is just an additional expensive piece of hardware in a company's inventory. Therefore, it is important that the first step any company takes before deploying a wireless solution is determining the required applications and how they affect other choices, such as device and network selection. For instance, if an application requires the transfer of large files, such as a video streaming application, the solution must deliver higher bandwidth to cover plant-wide video cameras. If the application is field data logging or the installation wireless sensors at different remote locations of a plant, then high-gain antennas and wider wireless coverage will be needed. In addition, time-sensitive applications, such as voice over wireless, require that employees at various locations receive effective connectivity and dedicated bandwidth.

Planning future requirements. A company must determine whether its current wireless infrastructure can support its future needs. For example, if a company is interested in Wi-Fi based, real-time location services to track employees and inventories in the plant, it should also evaluate whether the same wireless infrastructure can support multiple future applications or bandwidth needs, like wireless cameras for plant security or wireless field data logging applications for a

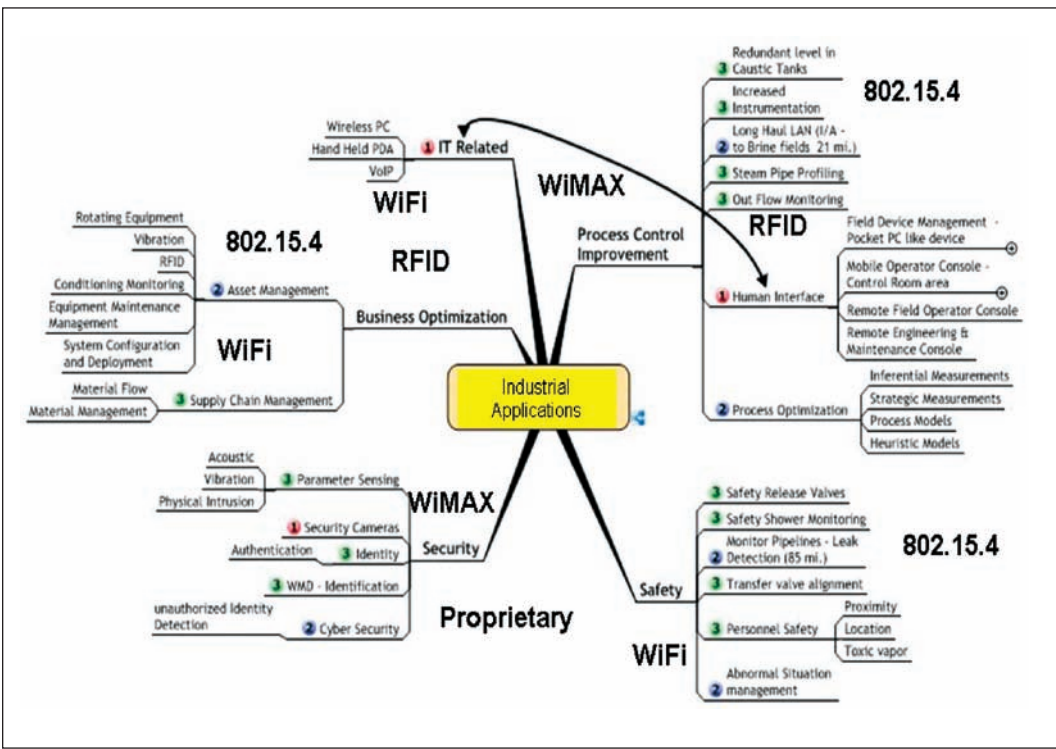
mobile workforce. Otherwise, plants could be installing multiple wireless links and access points supporting different applications that interfere with each other. In addition, there would be no way to manage them under a single architecture.

Centralize All Ad Hoc Wireless Initiatives. Distinct divisions may have wireless activities that are uncoordinated with other initiatives in the enterprise. For example, facilities management could have a two-way radio, while IT is planning to implement wireless LANs. In an Oil and Gas plant, the EHS manager may be considering wireless safety monitor solutions, or other wireless applications. Wireless-based asset and people tracking, wireless security cameras and building automation may also be on the horizon. Construction and expansion plans will usually trigger new infrastructure plans, including wireless.

Plants around the world are now beginning to realize that industrial wireless solutions require qualified experts to deliver and implement solutions to assure that corporate goals are met. Organizations depend on specialists to design and install systems that are dependable and allow for future applications. The implementation of uncoordinated wireless systems by separate departments or vendors is a formula for confusion and disorder.

One Device Does Not Fit All. There is no standard, “ideal” network that can be implemented to get information wirelessly. To assure that the best network for a particular situation is selected, it is critical to determine the needs of the workforce before choosing a provider or installing the network. The number of wireless devices available today is simply overwhelming, and it is highly unlikely that one device will fit all of a particular plant’s needs.

An effective wireless solution will require a combination of wireless standards. Numerous and diverse standards come into play when taking full advantage of wireless. Applications vary in their requirements for bandwidth, distance, power consumption and cost. For example, a remote battery-powered wireless transmitter is going to have little use for high bandwidth, but will require reasonable range and excellent power consumption. However, a wireless backbone will require higher bandwidth and longer distance, but will not be constrained by a specific power budget.



Taking full advantage of wireless communications in an industrial plant may require the interplay of numerous standards and protocols Including:

- WiMax (802.16 — for long-haul communications to other platforms and possibly to shore. It also allows the placement of a bubble over the platform for wireless backhaul between the other wireless applications.
- WiFi (802.11) — for control and maintenance as well as the operator interface for field data logging hand helds. It provides the interface for some types of video. Is used in VoIP voice communications applications.
- RFID — for asset tracking, location management and some safety applications.
- Sensor Bus (802.15.4) — for condition monitoring sensors for asset management. Also for some safety applications.

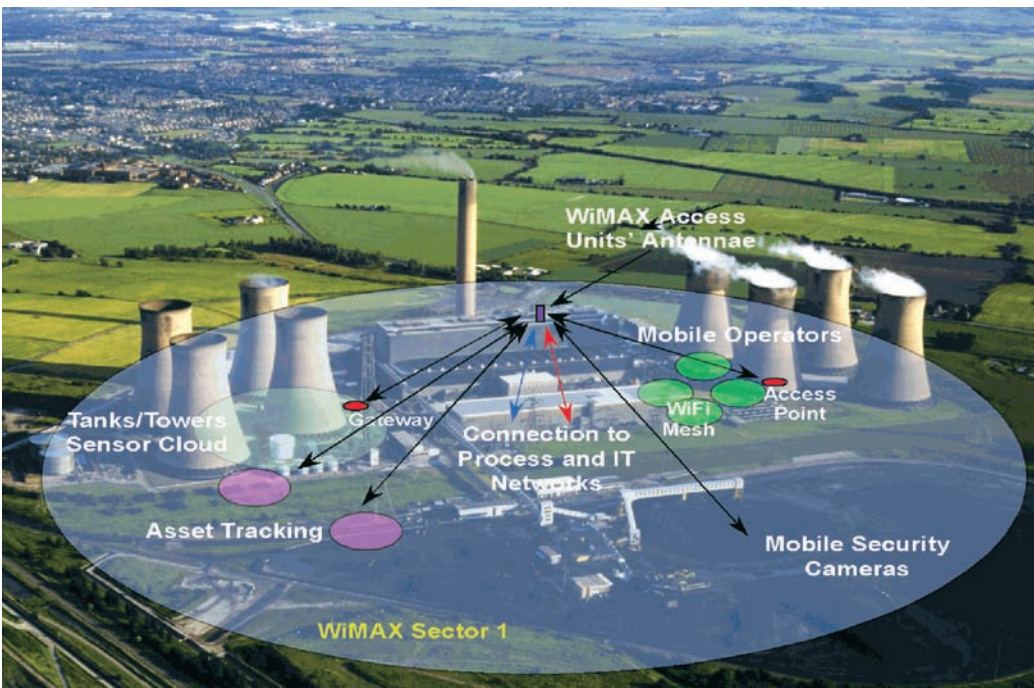
Enforcing Wireless Security Strategy and Policy. Compatibility and security problems can derail wireless projects. A facility-wide policy requiring coordinated planning, equipment and device qualification, and security standards is essential for trouble-free wireless and should not be compromised when implementing wireless solutions or networks. The risks of wireless technology should be carefully considered; appropriate steps should be taken to mitigate those risks before deploying wireless networks or applications.

The network must enforce a range of security protocols, as required by the client device. Also, the addition of a device with weak security capabilities must not compromise security for other services.

Steps that can be taken immediately to assure an effective wireless implementation include:

- Establishing a minimum set of security requirements for wireless networks and applications
- Adopting proven security policies and procedures to address the security weaknesses of the wireless environment
- Adopting strong encryption methods that encompass end-to-end encryption of information as it passes throughout the wireless network
- Adopting authentication protocols for using wireless applications that are separate and distinct from those provided by the wireless vendor
- Providing appropriate training to IT personnel on network, application and security controls so that they understand and can respond to potential risks
- Performing independent security testing of wireless network and application implementations

End-to-End Network Integration. Industrial plants search for the right kind of applications, processes and resources for implementing a reliable and robust infrastructure at minimal cost. As plants grow, there is an upsurge in demand to manage network and network-related issues. Network integration plays an important role in these solutions. Many enterprises outsource this service, which allows management to concentrate on their core competencies. Clearly, selecting the right partner is a key issue.



Scalable, Secure Common Infrastructure for Multiple Industrial Applications. The best practice is to use a single systems management approach that treats and manages all wireless network technology in a unified, coherent architecture. Such a framework helps technical professionals manage this diversity. Creating unified systems management is not just good practice. In fact, companies that attempt to implement more than a few tactical solutions without a unifying plan are taking a great risk.

With a unified architecture approach, plants can deploy a wide variety of necessary wireless devices to meet the needs of different departments. This allows for the easy upgrading of wireless devices and applications as new features and functionality become available.

5. THE BEST APPROACH TO WIRELESS: STEPS TO GET STARTED

- Identify user requirements
- Select and purchase hardware and software that is proven, scalable and capable of understanding diverse protocols
- Plan in detail for network migration or expansion, since networks are now the lifeline of the company
- Utilize the services of consultants so that you get quality advice from people who have gone through this experience
- Conduct an RF site survey, prior to implementation, to identify wireless signal paths and sources of potential interference
- Build ongoing maintenance, support and optimization services into the plan
- Strive to integrate wireless security and mobility products with existing enterprise identity management solutions
- Determine which classes of devices are allowed to touch the network and the policies that are involved

- Identify a wireless platform that can grow with changing networks and devices
- Storyboard the wireless application, verify user requirements — and only then start development

Improving the availability and utilization of assets can have a significant impact on the bottom line. Implementing a scalable and secure wireless system customized for an organization can offer:

- More measurements at lower cost — more measurements, even with a limited budget
- Greater availability of real-time data integration
- Significant cost savings by not having to run wires
- Workforce mobility — Connecting human, rolling and remote assets to applications in the field
- New applications driving bottom line improvements, including plant business optimization and enterprise asset performance management
- New measurements addressing mandated requirements
- Personnel and equipment safety
- Plant security

6. INVENSYS WIRELESS PERFORMANCE SOLUTIONS

The value of wireless solutions goes beyond the simple costs savings of running wires to provide significant return on investment through the lifecycle of the applications. Wireless technologies offer a new way to deliver existing functions or even new capabilities not possible with currently installed systems. Invensys Wireless Performance Solutions provide value-add enterprise applications through the combination of expert services, proven methodology and industry-leading technology. Invensys has the expertise to design, implement and manage a robust wireless solution set, removing the complexity and uncertainty associated with wireless technology while maximizing a company's return on investment.

Invensys provides a variety of enterprise wireless applications that will increase productivity, facilitate asset monitoring and improve safety and site security. At the core of these applications is an architecture that is designed to handle multiple devices. It supports a multitude of standards and uses a common security model that enables an enterprise to extend applications without losing initial investments.

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FOR MORE INFORMATION

Contact an Invensys sales representative to learn how the Invensys Wireless Solutions Portfolio can improve plant asset availability and utilization while driving optimal ROI.

North America

1 866 746 6477 US, Canada
1 508 549 2424 Worldwide

Latin America

54 11 6345 2100

Europe and Africa

+44 7713 50 3476

Mideast

+44 7713 50 3476

Asia Pacific

65 68298899

Email: [get more@ips.invensys.com](mailto:getmore@ips.invensys.com)

www.ips.invensys.com

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