



User Trends in Wireless Process Transmitters

The Global Foresight Group™

Rasmusson & Willey LLC
Minneapolis, Minnesota USA

INTRODUCTION

In the past several years, wireless technology has advanced to the point where dedicated wireless process transmitters are viable options for in-plant process applications. Up to this point wireless data communications in the process industries have been niche, monitoring applications where distance was sufficient to make wired solutions impractical. These applications typically have been line-of-sight, long-distance, implementations using transceivers powered by available line power or solar panels. Most recently, enabling technologies like mesh networks, low power electronics, power-management, long-life batteries, etc. have been incorporated into field instruments that are making them more suitable for continuous-process wireless applications.

The adoption of new technology such as the wireless process transmitter by the process industries has typically followed the well-known “S-curve”. Estimating the position of a technology on the adoption-rate curve can take many dimensions, such as competing products and technology, the state of technical advancement, etc. Two major factors are (1) the extent of experience and interest by end users and (2) the ability of suppliers to offer viable products based on the new technology.

This paper will address the first of these factors, the end-user situation, through a discussion of the results of an end-user, web-based survey.

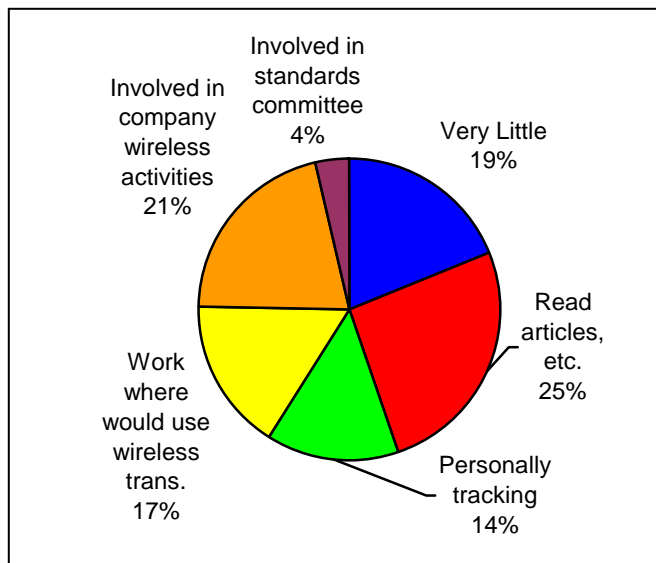
SURVEY OVERVIEW

A total of 74 process instrumentation and automation professionals participated in a web-based survey concerning wireless process transmitters.



Exposure

The respondents had a fairly even distribution of personal exposure to wireless field devices ranging from “very little” to “involved in company wireless activities” with a small number involved in wireless standards committee activities.



Geographic Distribution

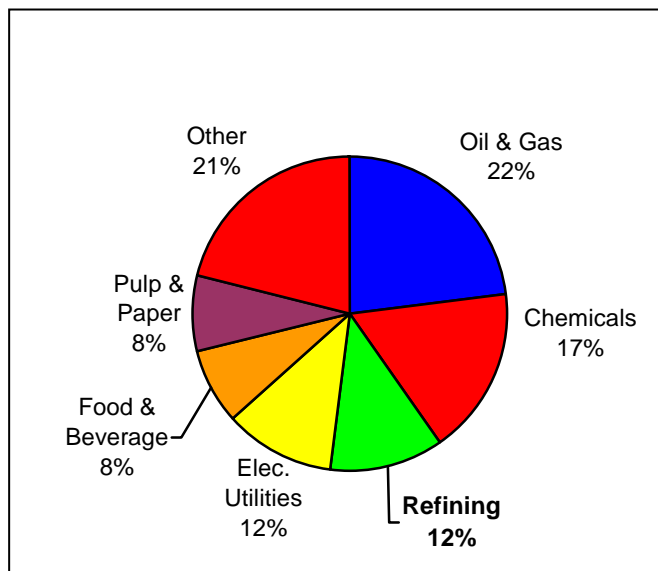
Responses were collected from contacts in Europe, Middle East, South America, and North America. The industry association of contacts was well distributed.

Survey Goals

The goals of the survey were to:

1. Identify the key accelerators or inhibitors to adoption of wireless process transmitters.
2. Use the results to estimate the extent of adoption rate of wireless process transmitters by End Users.

The survey was designed to assess qualitative factors and to provide directional and not “quantitative” insight into the adoption rate of wireless process transmitters.



Four areas concerning wireless process transmitters were covered in the survey: *status* of wireless use at the respondents company; *experience* of respondent; *priorities* of the respondent versus wireless use; and *barriers* to the use of wireless transmitters.



SURVEY RESULTS

Status

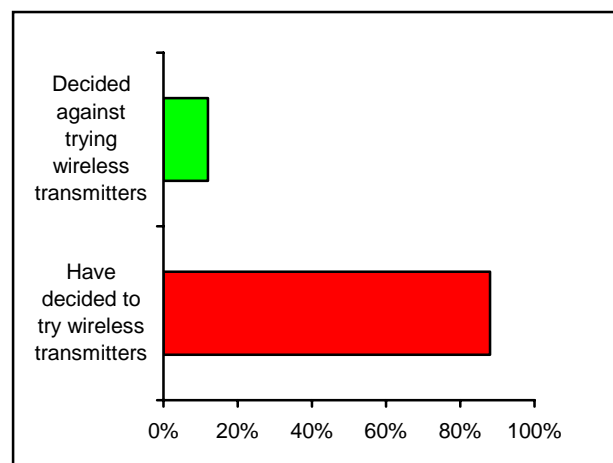
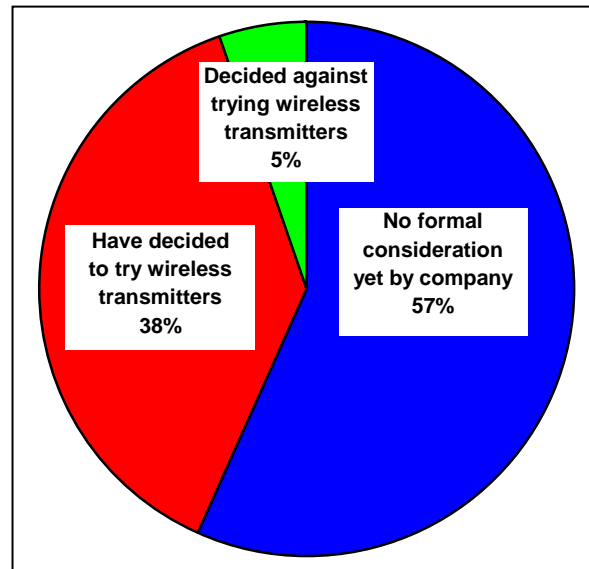
Question: “What is the status of wireless field device use at your company?”

Forty-three percent of the respondents worked for companies that had considered wireless transmitters. Of those:

- About 12 percent have decided against using wireless transmitters
- 88 percent have decided to try wireless transmitters

This suggests that as the companies enter the consideration phase, most choose to try wireless process transmitters. On the other hand, comments from those who decided against wireless represent the primary barriers to adoption of wireless today:

- “Awaiting standards”
- “RF interference, RF shielding, power supply concerns”
- “We decided to use wireless transmitters in an area where there was little infrastructure. As the infrastructure was built the wireless transmitters were removed.”
- “With high-speed network communication for wired transmitters and the possibility of data loss from wireless, wireless does not seem to offer any advantages.”



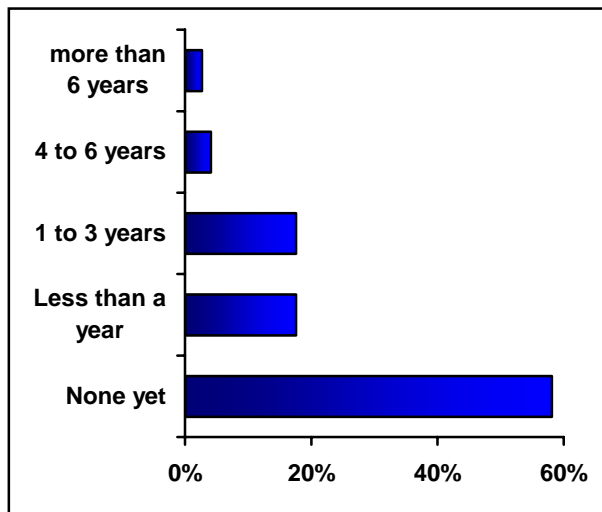


Experience

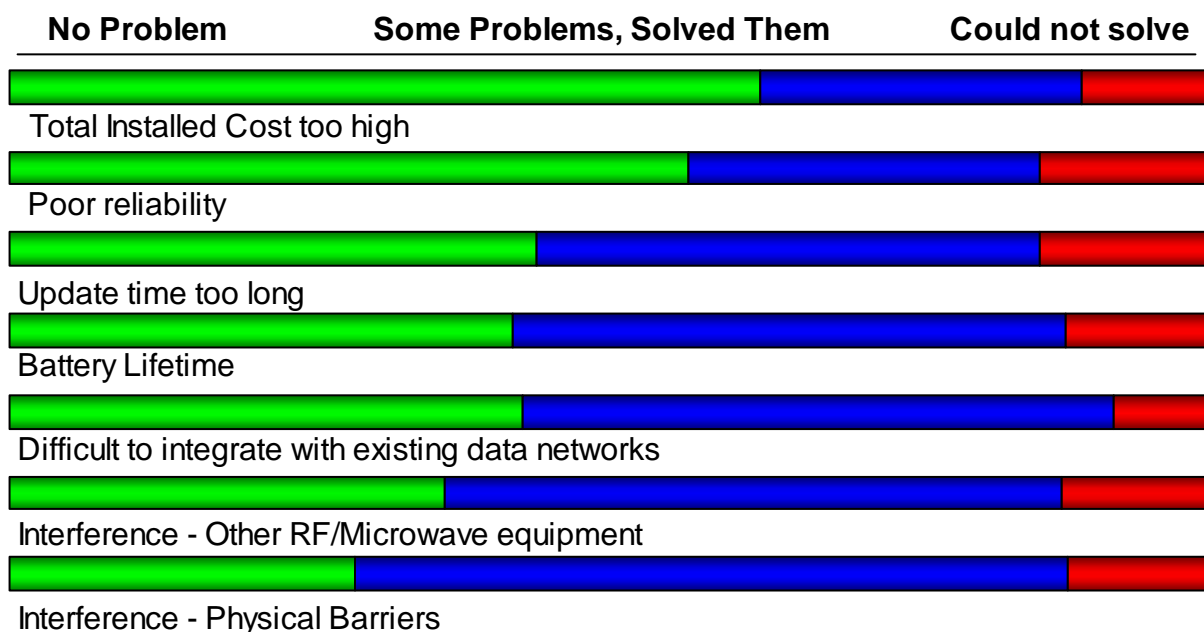
Question: "For how many years has your company been using wireless field devices?"

Seven percent of the companies had used wireless field devices for more than 4 years, 35 percent between 0 and 4 years, and almost 60 percent have not yet used any wireless field devices. This suggests that end users are still in the "early adopter" stage.

The long-term experience has typically been line-of-sight, relatively long-distance, implementations using transceivers powered by available line power or solar panels. Examples of this type of system are the Supervisory Control and Data Acquisition (SCADA) systems used in oil and gas applications. More current experience includes early implementations of dedicated wireless process transmitters for in-plant applications.



Question: "What were your experiences with your wireless evaluation or installation?"

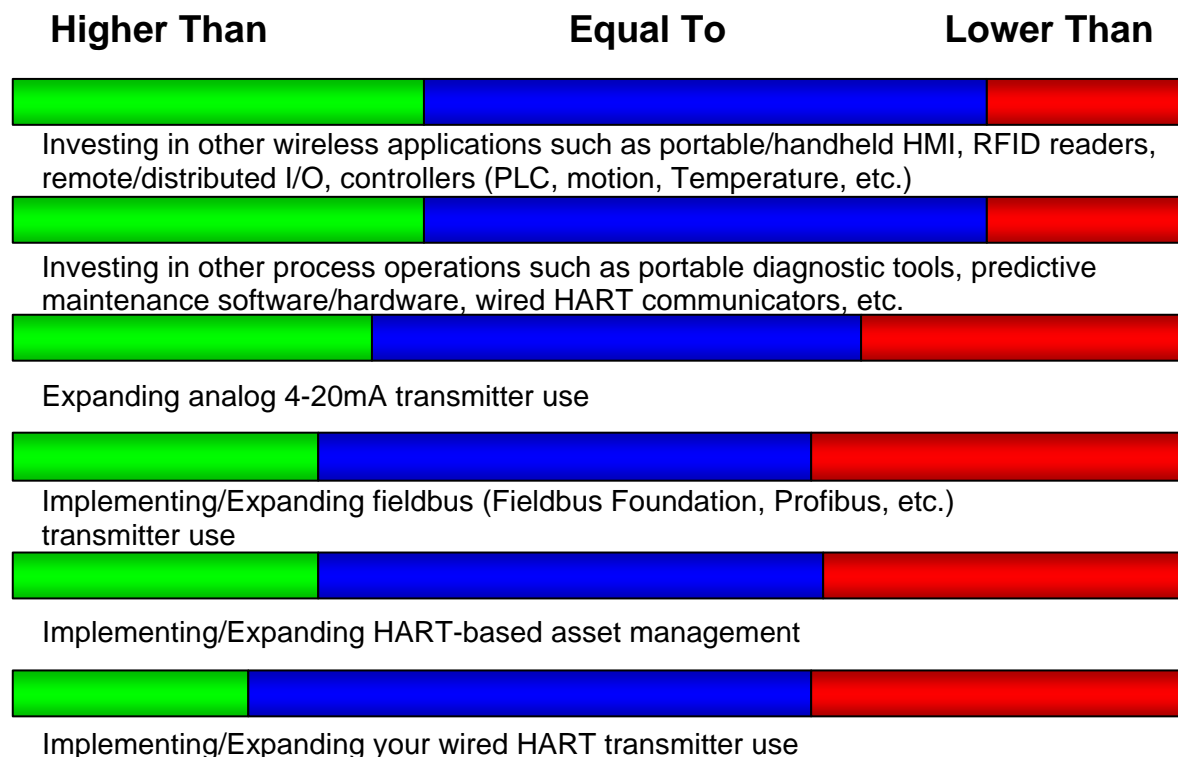




A little less than half the respondents described some experience with wireless field devices. Interference due to both physical barriers and other RF/microwave equipment was the most problematic for the respondents. Almost 60 percent of the respondents had some problems with integration of existing data networks, limited battery lifetime, and the length of update time. The respondents had the least problems with reliability and the total installation costs.

Priority

Question: "In your opinion, how would you rank the value of wireless field devices versus other in-plant options?"



End users clearly ranked the value of wireless field devices as higher priority than:

- Portable/handheld HMI, RFID readers, remote/distributed I/O, controllers (PLC, motion, temperature, etc.)
- Portable diagnostic tools, predictive maintenance software/hardware, wired HART communicators, etc.
- Expanding analog 4-20mA transmitter use



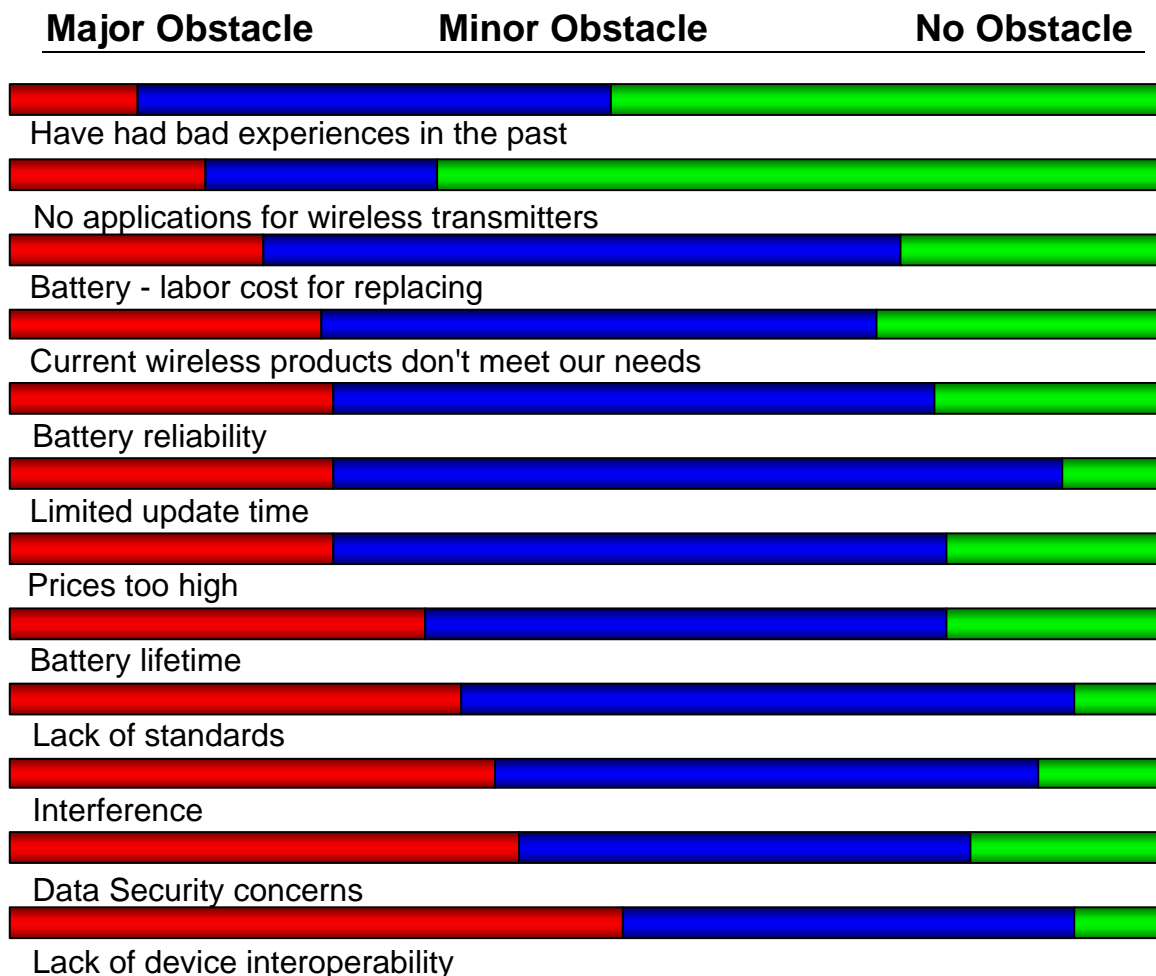
Wireless transmitters have a lower priority than the implementation of these options:

- HART-based asset management (About equal priority)
- Fieldbus (Fieldbus Foundation, Profibus, etc.) transmitter use
- Wired HART transmitter use

Wireless process transmitters are following closely the introduction of wired fieldbus process transmitters. Wired HART transmitters still have many years to go before analog-only transmitters are replaced. Wired HART and fieldbus transmitters will be significant competitors to the adoption of wireless process transmitters.

Barriers

"Please rank the following Obstacles to the use of wireless field devices in your opinion.





The respondents were presented with 12 potential obstacles to the adoption of wireless process transmitters. Obstacles ranked “Major” were product-related factors such as interoperability, security, interference, standards, and battery lifetime. Those ranked least of concern were intrinsic end-user factors such as price, lack of applications, bad experiences, etc. The ranking shows that the major obstacles can be solved or minimized through “product” or “technology” development versus more intrinsic end-user obstacles to the “use” of wireless technology. Suppliers can address the product development issues much more easily than the intrinsic end-user barriers.

MARKET SITUATION

Standards Activity

The HART foundation has already developed its own standard for the wireless implementation of HART transmitters -- wirelessHART. Just recently, ISA formed the SP100 Committee on Wireless Systems for Automation, which complicates the situation because HART is the global standard for smart process instrumentation with an installed base of more than 24 million devices worldwide. The HART Foundation and ISA recently agreed on an approach that will accommodate the HART wireless protocol. However, the development of standards is notoriously difficult and prone to delays. In 2008, many suppliers will be shipping devices based on wirelessHART, well in advance of any final SP100 standards. The survey results show that a “lack of standards” ranked as one of the major obstacles to using wireless process transmitters.

Supplier Activity

Recent product introductions by Emerson Process Management (using the HART Communications Foundation “wirelessHART” and Honeywell (using Honeywell’s proprietary OneWireless universal mesh network) will support the more rapid adoption of wireless process transmitters. It is expected that as many as eleven suppliers may introduce wireless field products for the process industry by the end of 2008.



SUMMARY

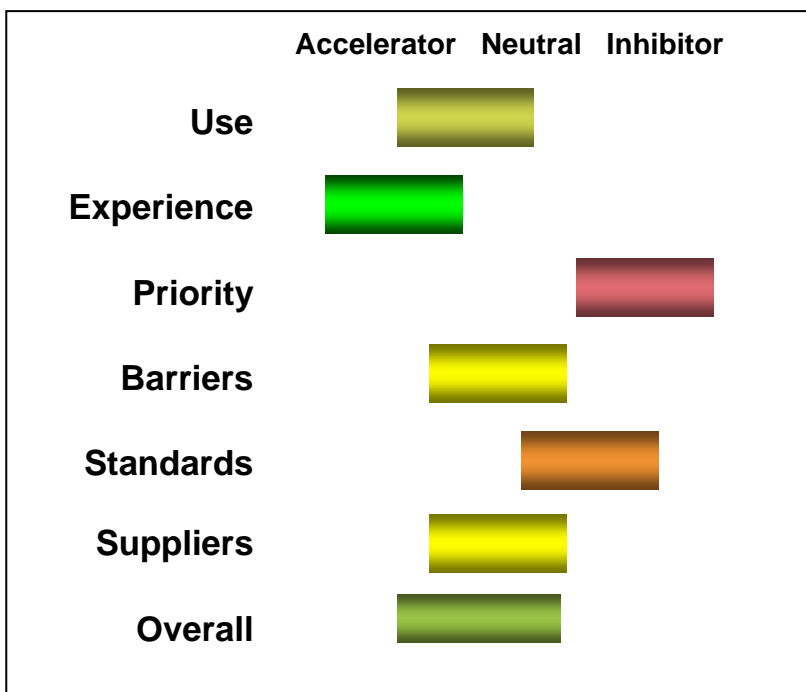
Based on the survey and review of the current market situation, the following summarizes the various factors affecting the adoption of wireless process transmitters.

Status of wireless use

From the survey, we saw that as end users begin to consider using wireless field devices, the majority decide to go forward with the implementation of wireless field devices.

Experience with wireless

There is a clear increase in the use of wireless devices that correlates with the advances in key technologies and product introductions.



Priority of wireless

End user priorities are the greatest inhibitors to adoptions. There is significant competition to the adoption of wireless in wired HART and Fieldbus implementations.

Barriers to wireless

The major barriers to adoption identified by the survey can be addressed by the suppliers through technology and product developments. This is considered mostly neutral, because the suppliers may or may not choose to react quickly.

Standards Activity

The development of standards is notoriously difficult and prone to delays. Only recently have the HART Foundation and the ISA ISP 100 committee reached initial agreements on the mutual development of wirelessHART protocols. This lack of standards will be an inhibitor to adoption.



Supplier Activity

Recent product introductions by at least two major suppliers with more companies to follow in late 2008 will help to accelerate adoption.

Overall

The totality of the current situation appears to indicate increasing acceleration in the adoption of wireless process transmitters.

S-CURVE POSITION

Assumptions

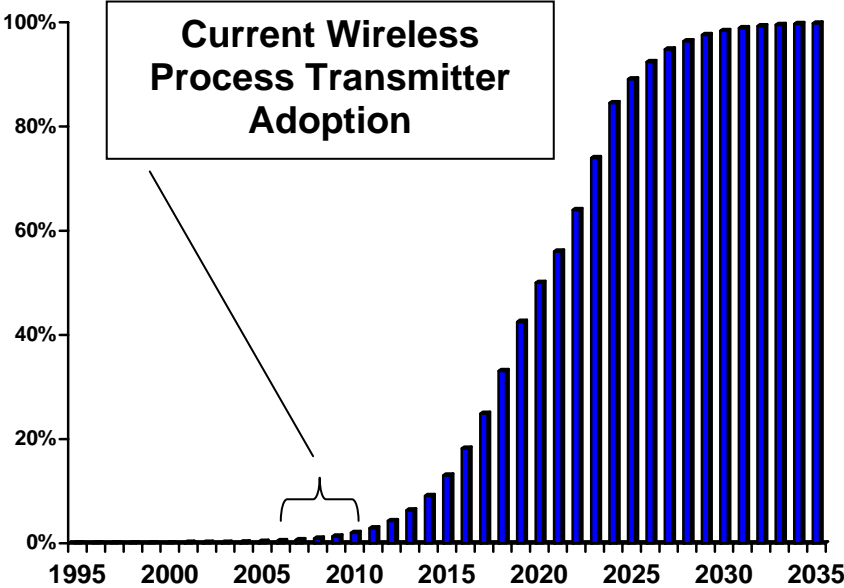
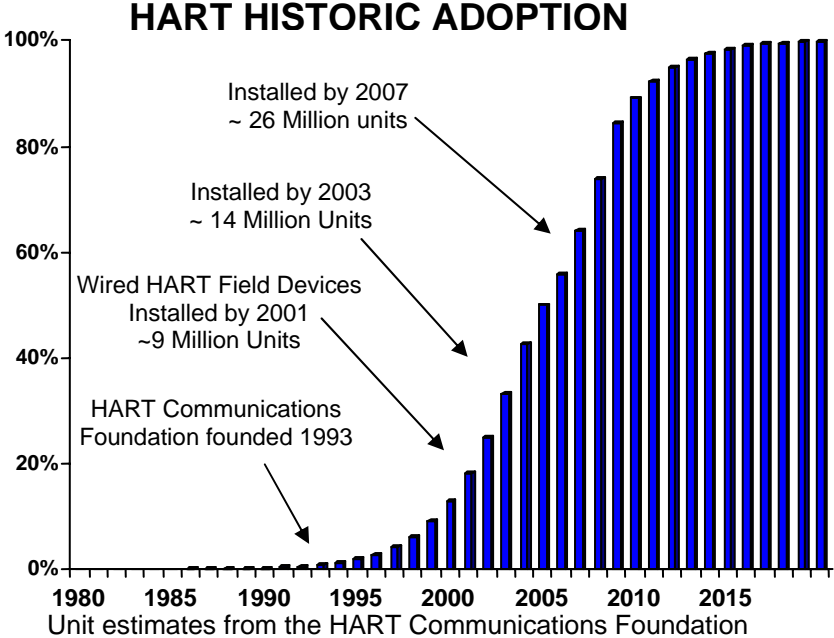
- The adoption of wireless process transmitters will follow a logistic curve based on the historic adoption of wired HART transmitters.
- While there are a number of different wireless implementations in process field applications (e.g., line-of-site, GSM, cellular, etc.), the market demand is converging on wireless process transmitters utilizing an existing data communications standard (e.g., HART, Fieldbus, Profibus, etc.).

Current Extent of Adoption

Based on the survey results and the current market situation, the approximate position of wireless process transmitters on the adoption curve is indicated in the charts at the end of this document. Assuming that the adoption of wireless process transmitters follows that of wired HART transmitters, it is expected that the use of wireless process transmitters should begin to accelerate after the year 2010. This accelerator will be contingent on (1) the ability of suppliers to increase the *priority* of wireless process transmitters with end users, (2) the finalization of *standards*, and (3) the reduction of *barriers* to adoption through supplier product and technology development.

OUTSTANDING QUESTION

Current wireless technology will not support its use in critical or control applications. For the near future, this will limit the application of wireless process transmitters to non-critical data acquisition, monitoring, and inventory management applications. Additional market research and end-user field experience will be needed before making estimates of the ultimate, total installed-base potential for wireless process transmitters in these non-critical applications.





The Global Foresight Group™, Rasmusson & Willey LLC, is a business research firm focused on the Instrumentation and Automation Industries.

Our goal is to provide *Foresight of Global* business conditions for our clients so they are better able to implement timely, knowledgeable, and actionable management decisions. Our capabilities are organized in four areas: Tactical, Strategic, Acquisitions, and Price Management.

The Global Foresight Group™

Rasmusson & Willey LLC

Minneapolis, Minnesota USA

952-920-9043

info@gfgroup.net

www.gfgroup.net