

MAGAZINE

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Conflicting Signals

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Abstract: Sensors could deliver widespread value to manufacturers, if only vendors could agree on how they should be deployed within a networked context.

Keywords: wireless sensors, industrial wireless sensors

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Industrial wireless sensor users aren't asking for much. They want a reliable, secure network that can transmit data at the pace of business, and they'd like a range of standards-based products and vendors from which to choose.

They may as well have asked for the moon.

Today's industrial wireless sensor networks market has a Rip Van Winkle quality to it: If you'd fallen asleep during the fieldbus wars of the 1990s and woken up in present day, you might wonder whether much time at all had passed. Today's battles eschew wires in favor of over-the-air transmissions, but the same fragmentation marks the terrain.

It is not unlike the early years of most innovative technologies, which tend to be marked by fractiousness, as eager startups pursue disparate paths to market and develop products that operate in dissimilar ways. Until standardization emerges — a process that can take many years — end users must deal with conflicting signals from the vendor community. More than a decade ago, this phenomenon gave users of industrial wired communications Foundation Fieldbus, Profibus-PA, Modbus, and other protocols. In recent years, the same discordance has given rise to wireless sensor specifications ZigBee, WirelessHART, 6LoWPAN, and ISA100.

Even with their comparatively short history, wireless sensor networks (WSNs) sport a rich pedigree. More than a decade ago, a presidential committee backed a National Academy of Sciences study stating that WSNs could save 10% of the energy costs in industrial settings, such as steel, paper, petroleum processing, and pharmaceuticals. Many also tout the savings associated with eliminating wires and related maintenance.

Manufacturers using wireless sensors need varying degrees of reliability, speed, and security, depending on the application. A mission-critical control system in a chemicals plant may need a full dose of all these characteristics, while a remote monitoring station with a temperature sensor that sends its readings twice a day may be able to compromise on transmission speed, but needs strong security protections.

In the past few years, WSNs have inspired a raft of competing, and sometimes overlapping, specifications. Amid the resulting confusion, some would-be players have turned their attention elsewhere.

When Jean-Pierre Desbenoit, the information and communication technologies manager at [Schneider Electric](#), looks at the manufacturing sector, he sees a market that has yet to announce its interest. "I don't know if the market is requesting these kinds of solutions," Desbenoit says. "When you speak with people in the manufacturing industry, most of the time they are quite happy with a legacy system, and what they just want is to make sure that everything is OK, and don't take any risk with a new, nice technology."

But while attention of late has turned to markets that hint at quicker returns — building and home automation and smart power grids — other experts characterize manufacturing as an inevitable, if slow-to-develop, market for wireless sensors.

"I think a lot of it will take hold in places [where] there's information value in a plant or a factory that surrounds the core process," says Glen Allmendinger, president of Harbor Research. An example, he says, is condition monitoring and diagnostics on a compressor in an oil refinery that's not central to the process.

The Buffet Is Open

Pioneering manufacturers must decide which wireless sensor technology satisfies their needs. Perhaps the most prominent of these is ZigBee, a specification that uses radio transmitters built on IEEE's 802.15.4 standard, features a lightweight power profile for its sensors, and allows them to connect via a mesh network that helps mitigate connection problems.

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