

Wireless in the works

Major suppliers may be on divergent paths for introducing wireless technology, but operators such as BP can offer clear direction on its adoption. Patrick Raleigh reports

THIS YEAR WILL SEE THE TRUE ARRIVAL OF wireless technology for the process industry with the commercial availability of systems from the two largest players in the field; Emerson Process Management and Honeywell.

Emerson has just launched Smart Wireless, which comprises a self-organising network made up of battery-powered and wireless-enabled measurement devices. Data travels across the device network to one or more gateways for entry into the plant control system. (See also news p6).

Honeywell, meanwhile, is preparing to launch a new wireless transmitter network in the second quarter of this year. This will feature a powered network of 'i-nodes' taking data from wireless measurement sensors across the site.

The vision from Honeywell is of an integrated wireless network that meets a full range of operator requirements. This includes supporting various industrial protocols and up to 30,000 devices, such as tablet PCs and sensors, coexisting with other wireless devices including PDAs, pagers and cell phones.

Industrial standards

Efforts to develop industrial wireless standards are focused on the Instrumentation, Systems and Automation (ISA) Society SP100 and Wireless HART committees. However, an industry-wide standard is not expected until mid-2008.

Emerson is guaranteeing an "easy upgrade" path for compliance to the industry standard when it is completed, offering to refund 50% of the costs of replacing the wireless circuit board on the actual measuring device to meet any future standard. For their part, Honeywell officials have highlighted the company's commitment to "investment protection" for end users.

Process operators, meanwhile, are looking to wireless technology to add real business value, both in terms of the installation costs and optimised operations from increased data availability, believes Tasos Anastasiou, project leader on BP's Refinery of the Future programme.

"If you are clever in how you use this data you can improve your operation, make your plant safer, and bring a step change in the performance of your

process plant." Anastasiou said at an Emerson Smart Wireless launch, held 11 Jan in Bologna, Italy.

BP has trialled Smart Wireless technology for the last two years at sites in North America and Europe. The first trial site at Cherry Point, Washington, used wireless devices used for temperature monitoring applications.

"The wireless system provided extremely high data reliability and all the data reached our system with absolutely no problem," according to the BP expert. Installation costs, he added, could be reduced by up to 90% compared to wired systems, though this very much depended on the application.

The network, added Anastasiou, proved "robust even in the heavy metal environment. Communications were up and running all the time even during a turnaround when some of the devices were under scaffolding. That was a big test for how successful this technology could be."

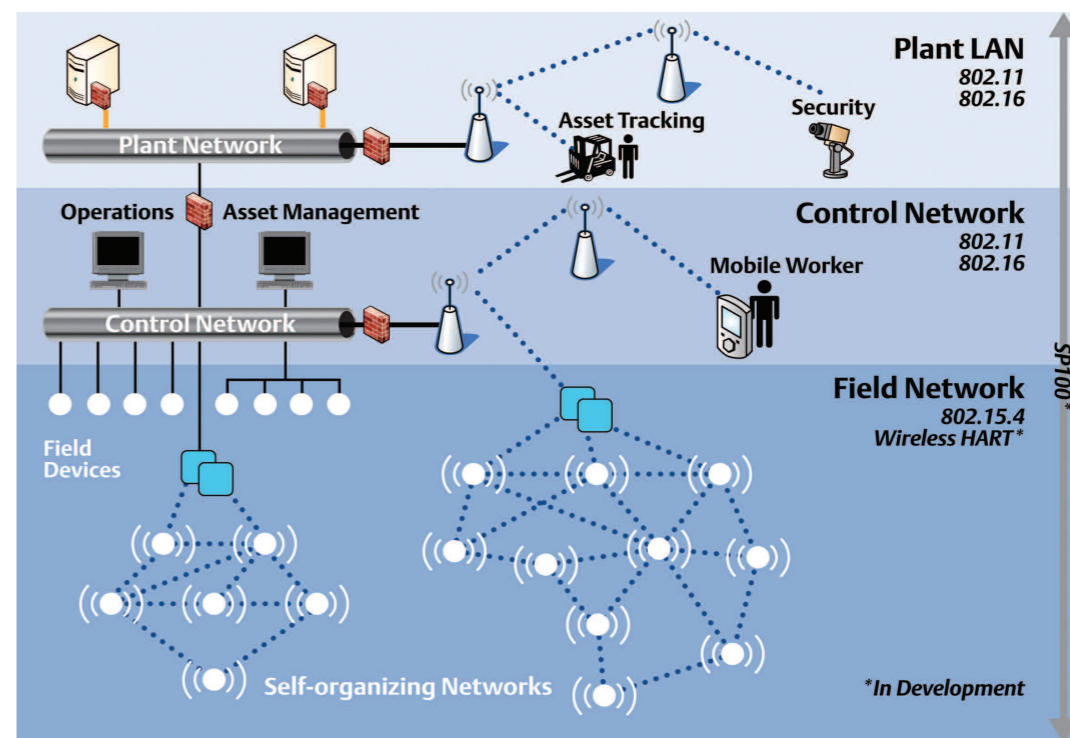
“ If you are clever in how you use this data you can improve your operation, make your plant safer, and can bring a step change in the performance of your process plant ” Tasos Anastasiou, BP



Although wireless was a brand new technology for them, BP personnel found configuration of devices easy and the network easy to integrate into existing systems. "So as far as training is involved then that's minimal," commented Anastasiou.

Addressing the limitations of wireless, Anastasiou said the transmission intervals mean the technology does not provide live data. "This is something we have to bear in mind when planning future applications for this technology."

BP believes wireless will complement, rather than compete with, existing data transfer technologies. "This first generation of [wireless] device is not aimed at control measurement or safety measurements. We are going to use this for monitoring secondary indicators. It won't quite compete with HART or Fieldbus devices, but gives you another alternative."



Self-organising networks are a central feature of the new wireless network technologies being introduced into the process industry

Anastasiou went on to emphasise that "effective use of energy is key to the success of the wireless system." BP, he said, "doesn't want to have to change batteries every six months or every year. We want something that we didn't have to touch until our next turnaround, every five years."

For Dan Sheflin, CTO Honeywell Automation and Control Solutions, battery power is key to the adoption of wireless in the market. "This is a big issue, the elephant in the room that nobody is addressing," he said at the Honeywell User Group meeting, held 13-16 Nov, in Seville, Spain.

With Honeywell's powered mesh, the battery-powered sensors do not participate in the mesh so demand on battery energy of the sensors is minimised. "We don't have to worry about messages hopping through the network and how that is going to affect battery life," said Sheflin.

Honeywell, therefore, believes that it can guarantee battery life for up to 10 years, as the battery-powered sensors are used only for transmitting, computing, receiving and sleeping, making it is easier to determine how long the batteries are going to last.

By contrast, "an ad hoc battery-powered mesh is the wrong answer," claimed Sheflin. "With the battery-powered mesh there is an inefficient balance," which, he said, could lead to overloading of a small number of sensors near the gateway.

Raising the spectre of operators having to drive round in trucks to check for battery dropouts, Sheflin

said: "In very large networks, sensors are distributed all over the place. With plant changes and putting in new networks you are going to have a very random situation where sensors are going to drop out."

But, said Bob Karschnia, vice president, technology at Rosemount, such a situation "just doesn't happen in practice," as usually around 30% of the devices connect directly to the gateway.

"Operators would, anyway, get an indication if two devices were handling the bulk of the load and could simply move the gateway to a different position to solve that problem. They would also stick in a redundant node device or another gateway to the network," continued Karschnia.

Smart Wireless also synchronises the transmission of data signals to the gateway to help optimise the power management across the network, said Karschnia. He added that devices that 'scavenge' power from thermal or vibrational energy in the plant itself can also bolster battery life.

Emerson expects its SmartPower technology to enable battery life of five to 15 years depending on application, but will not guarantee battery life.

Mark Schumacher, general manager and vice president of Rosemount's Pressure & CPS unit, said: "Once you know the number of [signal] hops and the system is optimised to reduce these, battery life can be predicted. But I don't think we will be in a position to guarantee battery life because of the variability of ambient conditions, number of hops, update rates and variability among the batteries themselves." ■

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