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WIRELESS WINNING WIDER ACCEPTANCE IN AUTOMATION

The undeniable appeal of wireless sensor networking is apparently convincing more end-users and system integrators to plan on implementing these technologies. **By Jim Montague, executive editor**

In summer, a young process control engineer's fancy turns to thoughts of…wireless? You bet. And a lot more of them apparently are thinking that way too.

Close to 20% more automation end-users and system integrators (SIs) in August 2005 considered deploying a wireless sensor network than those who considered doing so at the beginning of the year, according to recent research by B&B Electronics and Sensicast Systems. Their online survey found more than half (53%) of 200 respondents this past summer thought about adding a wireless sensor network in the next 12 months, while only 45% in January 2005 mulled adding wireless during 2005 (Figure 1). These data also are significant because most of the increase in respondents who plan to adopt wireless apparently come from among those who were previously undecided.

18% more respondents considered deploying wireless sensors networks in August than in January, 2005, and 53% are considering deployment in the next six months

The two companies released results of their latest survey in mid-October, and found strong and growing interest from respondents in wireless sensor networking. The August and January surveys formed a two-part series that B&B Electronics (www.bb-elec.com) and Sensicast (www.sensicast.com) designed to track industry attitudes about wireless technologies.

There are many reasons why wireless sensor networking is gaining momentum among users and SIs, but it's most likely that its appeal and advantages are finally beginning to outweigh traditional fears and actual drawbacks related to it. In short, cost savings, ease of implementation, safety and security levels of wireless are replacing concerns and criticism as users

FIGURE 1.

WIRELESS RESEARCH, DEPLOYMENT PLANS

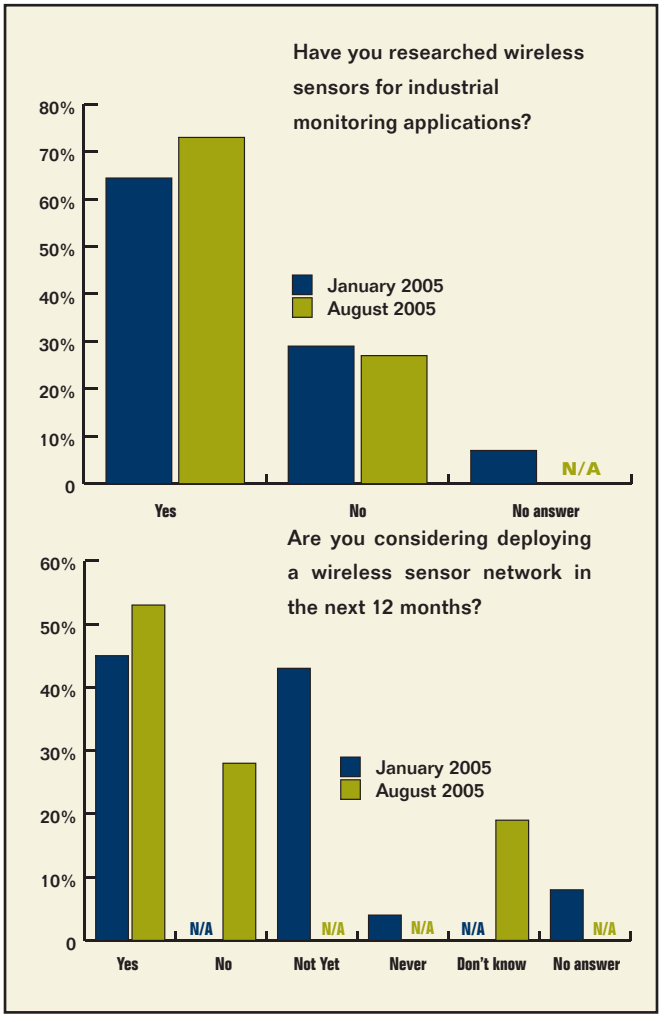


FIGURE 2.

EXPECTED WIRELESS SENSOR USE

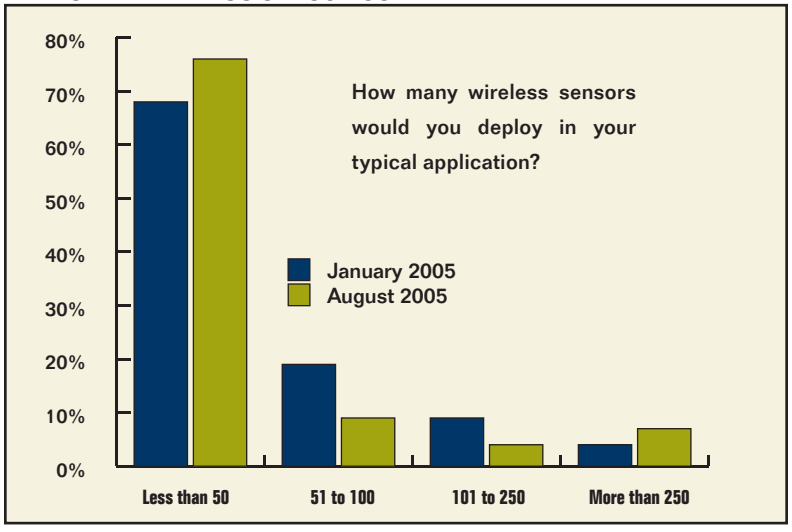
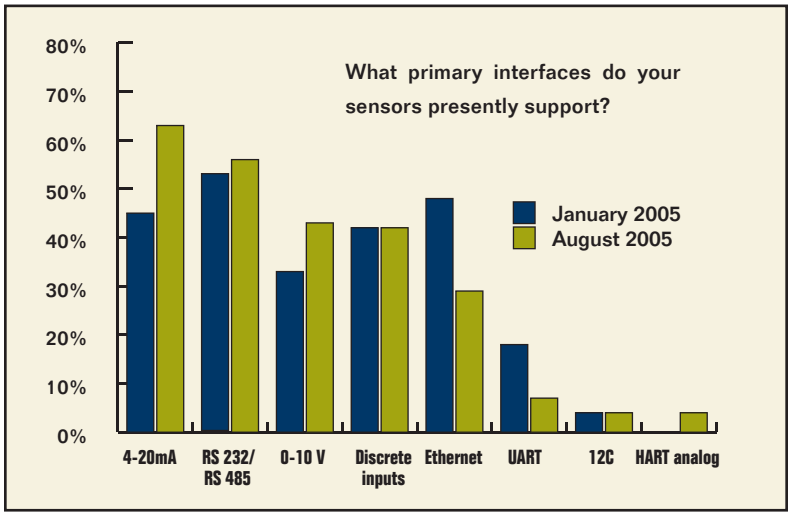


FIGURE 3.

PRIMARY SENSOR INTERFACE SUPPORT



learn more about wireless and how to use it. Wireless manufacturers also are offering site surveys to determine what wireless solutions are most appropriate for individual applications, and are helping users experiment and try out wireless in smaller, representative sections of their facilities. More than two-thirds of January's respondents and three-quarters of August's plan to install 50 wireless sensors or less in their applications (Figure 2).

Don Wiencek, B&B Electronics' president, says, "Our field experience has proven the robustness of the technology. Now, the survey results show that our customers are increasingly eager to use wireless sensing in their projects."

Research breeds familiarity

Not only are implementation plans increasing, but they seem to be fueled by a growing interest in wireless sensor networks for industrial monitoring. The survey found that 73% of respondents in August are researching wireless sensors for use in more rugged environments, compared to 64% who were interested in January.

The researchers add that reliability of wireless sensor networking was the main reason respondents say they're delaying deployment. Thirty-three percent report that reliability is their greatest concern about adopting wireless technologies.

Despite these persistent worries, however, the survey also revealed that respondents had a strong understanding of which applications were appropriate for wireless sensor networks. The applications chosen as most appropriate were process (66%), environmental (61%) and machine (53%) monitoring/predictive maintenance, which were followed by process control (38%) and industrial safety monitoring (23%).

In addition, the respondents reported that 2.4 GHz remains their favored wireless operating frequency. More than twice as many respondents selected 2.4 GHz (35%) in August, compared to 900 MHz (16%), which parallels results in January.

Also, in the January survey, 69% of respondents confirmed that they plan to use their wireless sensors in harsh, radio frequency (RF) environments, while 46% added that battery-operated wireless sensors were important in their applications.

"Our latest survey clearly reveals the industrial sector's growing interest in wireless sensor networks and monitoring capabilities that work well within challenging RF [radio frequency] environments," says Paul Sereiko, Sensicast's CEO.

Despite their wireless aspirations, both January and August's respondents report their present sensors are firmly grounded in traditional interfaces, including 4-20 mA, RS 232, RS 485, 0-10 V, discrete inputs, Ethernet, and HART analog (Figure 3).

FIGURE 4.

SENSORS TYPES IN WIRELESS NETWORKS

What types of sensors would you use in your wireless network? (January 2005)

51%	Voltage
49%	Pressure
48%	Electric current
46%	Flow
41%	Humidity/moisture/ condensation
38%	Presence/proximity
35%	Level
26%	Motion
25%	Position (angular, linear)
19%	Gas
18%	Displacement
19%	Weight
17%	Light (UV, VIS, NIR, IR)
16%	Acceleration
13%	Velocity
12%	Sound
12%	Force
11%	Strain
10%	Magnetic
4%	Particle

FIGURE 5.

WIRELESS SENSOR FUNCTIONS NEEDED

What types of functionality are you looking for in a wireless sensor system? (August 2005)

76%	Interface to existing system(s)
64%	Data logging
50%	Data display
49%	Event logging
27%	Alert messages via e-mail
26%	Alert messages to mobile phones
19%	System control via PDAs
14%	Custom messaging for multiple recipients
12%	Alert messages to pagers
11%	Alert messages via instant message
7%	System control via instant message
2%	Dedicated controller
1%	Initiate video
1%	Long life
1%	Motor control

Standards and savings

End-users and SIs answering the January 2005 survey further indicated their awareness of the IEEE 802.15.4 (37%) and ZigBee (41%) wireless standards. In addition, 24% added it was very important to support 802.15.4 in their products, while 12% said it was very important to support ZigBee in their products. They added that ZigBee was needed to encourage interoperability (61%), standards (50%), multiple vendors (42%), mesh networking (39%), and to lower costs (18%).

These standards are expected to further enhance the savings that implementing wireless can generate. By deploying wireless sensors in their applications, the January respondents anticipate saving various amounts per sensor. For example, 15% expect to save less than $50; 27% expect to save $51-100; 25% expect to save $100-250; 13% expect to save $250-500; and 20% expect to save more than $500 per sensor.

For more information and results from B&B Electronics survey, visit www.bb-elec.com/wirelesssurvey.