Mobility, Ethernet, and Wireless Study: Wireless results

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Introduction and methodology

Objective
*Control Engineering* performed this research to better understand more about integration, use, and spending for mobility, Ethernet, and wireless technologies and how they help users of automation, controls, and instrumentation to be more productive.

Sample
The sample was selected from recipients of *Control Engineering* for whom email addresses were available.

Method
Subscribers were sent an email asking them to participate in this study. The email included a URL linked to the questionnaire.

- **Data collected:** Oct. 11, 2013, through Oct. 29, 2013
- Respondents were asked about the technologies or services they buy or specify that use, connect with, or support mobility, Ethernet, or wireless technologies. Those responding positively were asked about specific products, spending trends, use of mobility devices, integration, protocols, security, and mobile applications.
- **Number of respondents:** 200
  - Margin of error: +/- 6.9 at a 95% confidence level
- **Incentive:** Survey participants were offered the opportunity to enter a drawing for a $150 VISA gift card.
Executive summary: Wireless

*Control Engineering* identified the following trends about integration, use, and spending for wireless technologies and how they help users of automation, controls, and instrumentation to be more productive. These technologies are key components in plant to enterprise integration, industrial Internet, Internet of things (IOT), and big data analytics and optimization.

- More than 25% of respondents use, specify, or expect to specify five wireless products; 46% do so for routers. Eighty-one percent of respondents have some familiarity or consider themselves to be experts with wireless devices.
- Most used wireless protocols: IEEE 802.11n (WLAN) (58%), Bluetooth (50%), and IEEE 802.11g (43%); 20% or more use eight wireless protocols.
- A strong correlation exists between wireless spending and productivity. Just over half of respondents expect their wireless products and services spending to increase next year and expect that productivity resulting from wireless will increase.
- More than half of respondents reported that wireless is either somewhat or highly integrated with their controls, automation, and instrumentation at their locations. Only 23% felt wireless integration was easy; more than one-third called it difficult or worse.
- Greatest wireless benefit is data access (59%); also important are productivity increases (41%), followed closely by cost savings, time savings, and ease of use.
- Challenges are security, no capital budget, lack of training to support adoption or integration, need for use cases, and no integration or services budget.
Respondent profile
Job function and industry experience

Thirty percent of respondents indicated system or product design, control or instrument engineering as their primary job function. Just over half of respondents (52%) have 20 or more years of industry experience.

Primary job function

- System or product design, control or instrument engineering: 30%
- Other engineering: 18%
- System integration or consulting: 17%
- General or corporate management: 13%
- Operations or maintenance: 12%
- Process, production or mfg engineering: 8%
- Other: 5%

Industry experience

- Less than 5: 14%
- 5 to 9: 13%
- 10 to 19: 23%
- 20 to 29: 30%
- 30 or more: 22%

Q: Please indicate your primary job function. (n=200)
Q: For approximately how many years have you worked in your current industry? (n=200)
Involvement in selection of technologies and services

The top three technologies or services respondents buy or specify that use, connect with, or support mobility, Ethernet, or wireless technologies are computers, IPCs or PC-based control (73%); PLCs or PACs (72%); and HMI hardware, OI, control panels, alarms, annunciators, data acquisition equipment or data recorders (71%). (A positive reply was required on this question to be included in survey results.)

- Computers, IPCs or PC-based Control: 73%
- PLCs or PACs: 72%
- HMI Hardware, OI, Control Panels, Alarms, Annunciators, etc.: 71%
- Wired Networking Hardware, Ethernet Switches, etc.: 64%
- Software: 52%
- Motors or Drives: 52%
- Wireless Infrastructure, Wireless Field Devices or WLANs: 49%
- Field I/O Infrastructure or I/O Systems: 48%
- Power Supplies or UPS: 44%
- Process Sensors or Transmitters: 44%
- Discrete Sensors: 43%
- DCS or Process Control Platforms: 43%
- Enclosures: 41%
- Motion Control Systems, Robots or Robotics: 37%
- Relays, Switches or Timers: 37%
- Analytical Instruments, Test or Calibration Equipment: 35%
- Machine Vision Systems or Vision Sensors: 35%
- Valves, Actuators or Positioners: 35%
- Safety for Process or Machine Systems: 34%
- Power Distribution Systems or Power Protection Systems: 33%
- RFID, Bar Code Readers or Laser Scanners: 26%
- Single-Loop Controllers, Regulators or Data Recorders: 23%
- Embedded Systems, Embedded Components or SBCs: 22%

Q: Which of the following technologies or services do you buy or specify that use, connect with, or support mobility, Ethernet, or wireless technologies? (n=200)
Interface with technologies and implementing security

Seventy-seven percent of respondents interface with industrial mobility, Ethernet, or wireless technologies on the plant floor, with half reaching into the enterprise. Device security is most implemented using IT rules (71%).

**Interfacing with technologies**

- Place of business (plant floor/operations): 77%
- Place of business (reaching into enterprise): 50%
- Other company locations: 39%
- Customer locations: 36%
- Home: 35%
- With service providers or system integrators: 21%
- With product suppliers, vendors: 19%

**Implementing security**

- IT rules are used: 71%
- Local dept. rules: 10%
- System integrator decides: 11%
- Rely on each person to do the right things: 7%
- Other: 3%

Q: Where do you interface with the industrial mobility, Ethernet, or wireless technologies mentioned above? (n=200)
Q: How is security implemented for these devices? (n=200)
Company size and location

Forty-six percent of respondents have fewer than 100 employees at their respective locations, and nearly one quarter of respondents (22%) are based outside the U.S.

### No. of employees

<table>
<thead>
<tr>
<th>Number of Employees</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>1,000 or more</td>
<td>11%</td>
</tr>
<tr>
<td>500 to 999</td>
<td>10%</td>
</tr>
<tr>
<td>250 to 499</td>
<td>14%</td>
</tr>
<tr>
<td>100 to 249</td>
<td>20%</td>
</tr>
<tr>
<td>Less than 100</td>
<td>46%</td>
</tr>
</tbody>
</table>

### Location

- East North Central: 19%
- South Atlantic: 15%
- Based outside the U.S.: 22%
- Middle Atlantic: 9%
- West North Central: 9%
- West South Central: 7%
- Mountain: 4%
- New England: 3%
Plant networks

Of the respondents who confirmed they have a plant network on site (80.5%), just over three quarters of their sites allow the use of mobile devices on the plant network.

Q: Does your site have a plant network? (n=200)
Q: Does your site allow use of mobile devices on the plant network? (n=161)
Businesses and industries

The top three industries represented are involved in engineering, system integration, and/or architectural services (28%); instrumentation, measurements, and/or control systems/devices (27%); and industrial machinery (24%). Seventeen industries are in the double digits.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Engineering, system integration, architectural services</td>
<td>28%</td>
</tr>
<tr>
<td>Instrumentation, measurement, control systems/devices</td>
<td>27%</td>
</tr>
<tr>
<td>Industrial machinery</td>
<td>24%</td>
</tr>
<tr>
<td>Food, beverage, tobacco</td>
<td>20%</td>
</tr>
<tr>
<td>Computer/communication systems, peripherals, equipment</td>
<td>20%</td>
</tr>
<tr>
<td>Chemicals</td>
<td>20%</td>
</tr>
<tr>
<td>Other manufacturing or processes</td>
<td>19%</td>
</tr>
<tr>
<td>Consulting, business, technical services</td>
<td>19%</td>
</tr>
<tr>
<td>Electrical equipment</td>
<td>18%</td>
</tr>
<tr>
<td>Automotive, transportation</td>
<td>15%</td>
</tr>
<tr>
<td>Petroleum, refining</td>
<td>13%</td>
</tr>
<tr>
<td>Engine, turbine, mech., elec. power transmission equip.</td>
<td>12%</td>
</tr>
<tr>
<td>Aircraft, aerospace, defense</td>
<td>11%</td>
</tr>
<tr>
<td>Wood, paper, printing</td>
<td>10%</td>
</tr>
<tr>
<td>Plastics, rubber</td>
<td>10%</td>
</tr>
<tr>
<td>Primary, fabricated metals</td>
<td>10%</td>
</tr>
<tr>
<td>Pharmaceuticals</td>
<td>10%</td>
</tr>
<tr>
<td>Semiconductors, other electronic components</td>
<td>9%</td>
</tr>
<tr>
<td>Other</td>
<td>10%</td>
</tr>
</tbody>
</table>

Q: In which of the following industries is your company involved? (n=200)
Wireless
Wireless products specified and expertise

More than 25% of respondents use, specify, or expect to specify five wireless products; 46% do so for routers. Eighty-one percent of respondents have some familiarity or consider themselves to be experts with wireless devices.

<table>
<thead>
<tr>
<th>Products specified</th>
<th>Level of expertise</th>
</tr>
</thead>
<tbody>
<tr>
<td>Routers</td>
<td>Expert 28%</td>
</tr>
<tr>
<td>Antennae</td>
<td>Some familiarity 53%</td>
</tr>
<tr>
<td>Modules</td>
<td>Novice 18%</td>
</tr>
<tr>
<td>Receivers</td>
<td>None 1%</td>
</tr>
<tr>
<td>Gateways</td>
<td></td>
</tr>
<tr>
<td>Handheld instruments</td>
<td></td>
</tr>
<tr>
<td>Other infrastructure hardware</td>
<td></td>
</tr>
<tr>
<td>Services for infrastructure</td>
<td></td>
</tr>
<tr>
<td>Other infrastructure software</td>
<td></td>
</tr>
</tbody>
</table>

Q: Identify the specific products you use, buy, or specify, or expect to within the next 12 months for business/professional purposes. (n=200)
Q: For each of the following, please define your level of expertise: (n=200)
Wireless technology ownership

Seventy-two percent of respondents indicated that 76% to 100% of the wireless technologies they use, buy or specify are provided by their company as opposed to being brought in by the employees.

Q: For the mobility, Ethernet, and wireless technologies you use, buy, or specify in these locations, please define the mix. (n=200)
Wireless protocols

The top three wireless protocols used in respondents’ facilities are IEEE 802.11n (WLAN) (58%), Bluetooth (50%), and IEEE 802.11g (43%). Twenty percent or more use eight wireless protocols, though only 2% use WIA-PA and ISA 100.11a to date.

Q: Which wireless protocols do you use in your facility? (n=200)
Wireless products and services spending and productivity

A strong correlation exists between spending and productivity. Just over half of respondents expect their wireless products and services spending to increase next year. Fifty-two percent of respondents believe that productivity resulting from wireless will increase at their location in the next 12 months.

Products and services spending outlook

<table>
<thead>
<tr>
<th>Decrease</th>
<th>Remain the same</th>
<th>Increase</th>
<th>Significantly increase</th>
<th>Not sure</th>
</tr>
</thead>
<tbody>
<tr>
<td>4%</td>
<td>41%</td>
<td>39%</td>
<td>13%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Productivity outlook

Q: Complete the following statements by estimating the spending trend this year and next year for your location and productivity results this year and next year for your location. (n=200)
Budget, services and integrating Wireless devices

Forty-five percent of respondents reported that they spend more money on wireless products than they do on wireless services. Respondents also reported that business IT (35%) and operations or engineering (30%) most often works on, services, and integrates wireless devices at their location.

**Products and services budget**

- Products, 45%
- Services, 26%
- About the same, 29%

**Servicing and integrating**

- Operations or engineering: 30%
- Business IT: 35%
- Manufacturing IT: 13%
- System integrator: 13%
- Consultant: 5%
- Other: 4%

Q: For the products and services you purchase, what do you spend more money on for Ethernet and wireless? (n=200)
Q: For the following, indicate who most often works on, services, and integrates these devices at your location: (n=200)
Integrating wireless technologies

Fifty-three percent of respondents reported that wireless is either somewhat or highly integrated with their controls, automation, and instrumentation at their locations. Only 23% felt wireless integration was easy; more than one-third called it difficult or worse.

**Wireless integration**

- Highly integrated, 17%
- Somewhat integrated, 36%
- Not very integrated, 33%
- Not integrated, 14%

**Integration experience**

- Easy (plug and play) 23%
- More challenging (plug, configure, and play) 40%
- Difficult (plug, configure, unplug, call someone) 20%
- Tried, but didn't have resources (tried, gave up) 6%
- Knew better than to even try 11%

Q: Currently, how integrated with controls, automation, instrumentation are following technologies? (n=200)
Q: How was the integration experience in the last 12 months? (n=200)
Wireless technology benefits

The top benefit of wireless technology is data access (59%). Second in a statistical dead heat are productivity increases (41%), cost savings (39%), time savings (38%), and ease of use (36%).
Wireless adoption challenges

Security issues are the largest challenge at 52%; others include no budget, lack of investment for capital investments; lack of training/education/processes to support adoption or integration; too few use cases; no budget for system integration or services, lack of business case, and safety; 10% see no need.

<table>
<thead>
<tr>
<th>Challenge</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security issues</td>
<td>52%</td>
</tr>
<tr>
<td>No budget, lack of investment for capital investments</td>
<td>39%</td>
</tr>
<tr>
<td>Lack of training/education/processes to support adoption or integration</td>
<td>38%</td>
</tr>
<tr>
<td>Lack of knowledge of use cases or benefits</td>
<td>37%</td>
</tr>
<tr>
<td>No budget, lack of investment for system integration or services investments</td>
<td>35%</td>
</tr>
<tr>
<td>Lack of business case to support investment</td>
<td>32%</td>
</tr>
<tr>
<td>Safety issues</td>
<td>31%</td>
</tr>
<tr>
<td>No need for this technology</td>
<td>10%</td>
</tr>
</tbody>
</table>

Q: What challenges do you see with adoption (or additional use) of these technologies in your business? (n=200)