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# Industrial Ethernet

*August 2013*

*Market Intelligence Report*

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## Executive Summary

An electronic survey of *Industrial Networking* readers was conducted in August, 2013, in order to identify usage and application trends of **Industrial Ethernet** among the magazine's readership. Detailed survey results are presented on the pages that follow, with key findings summarized below:

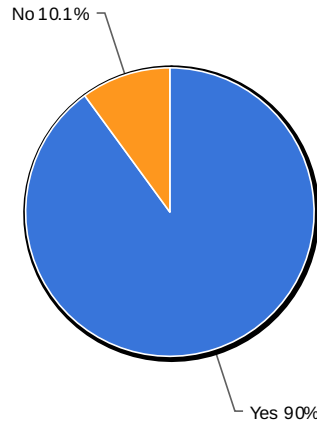
- 90% of survey respondents currently recommend, purchase or specify Industrial Ethernet equipment with the following most common applications:
 

|                                     |     |
|-------------------------------------|-----|
| HMI to controller                   | 69% |
| Controller to controller            | 69% |
| Machine control                     | 61% |
| Maintenance and diagnostics         | 50% |
| Batch/Process control               | 49% |
| Electronic Drives                   | 48% |
| Process Safety                      | 36% |
| Device-level network                | 36% |
| Machine/Cell safety                 | 34% |
| Front-office/enterprise integration | 20% |
| Building environmental controls     | 16% |
| Physical/Perimeter Security         | 12% |
- Nominal data rate required by most Industrial Ethernet specifiers was 100 MBps on Cat6 Copper (61%), followed by 12% at Gigabit with Cat5/6 Copper, and a further 12% 100 Mbps with Fiberoptics, and 8% 10 MBps with Cat5 Cooper.
- At 84%, PLCs top the list of Industrial Ethernet-enabled equipment planned for installation in the next 18 months. HMI (72%) and remote I/O (70%) round out the top three for planned purchases of Ethernet-enabled equipment.
- At most respondents' plants, control engineers claim to maintain primary responsibility for Industrial Ethernet projects (72%). At 4% of facilities it is the IT department's responsibility, and at 24% of facilities the responsibility is shared.
- When asked about the benefits of Industrial Ethernet, the majority of respondents indicated open standards (72%), interoperability (65%), low cost (55%), web-enabled data access (43%), uniformity (38%), and leverages corporate IP infrastructure (26%).
- Factors most often mentioned as limiting usage of Industrial Ethernet included legacy equipment (28%), cost (26%), security fears (26%), lack of

deterministic behavior (22%), experience (21%), maintenance (16%), and training (15%).

- The top three most commonly deployed “flavors” of Industrial Ethernet included ‘standard’ Ethernet or Ethernet TCP/IP IP (71%), Modbus TCP/IP 50%, and EtherNet/IP (43%).

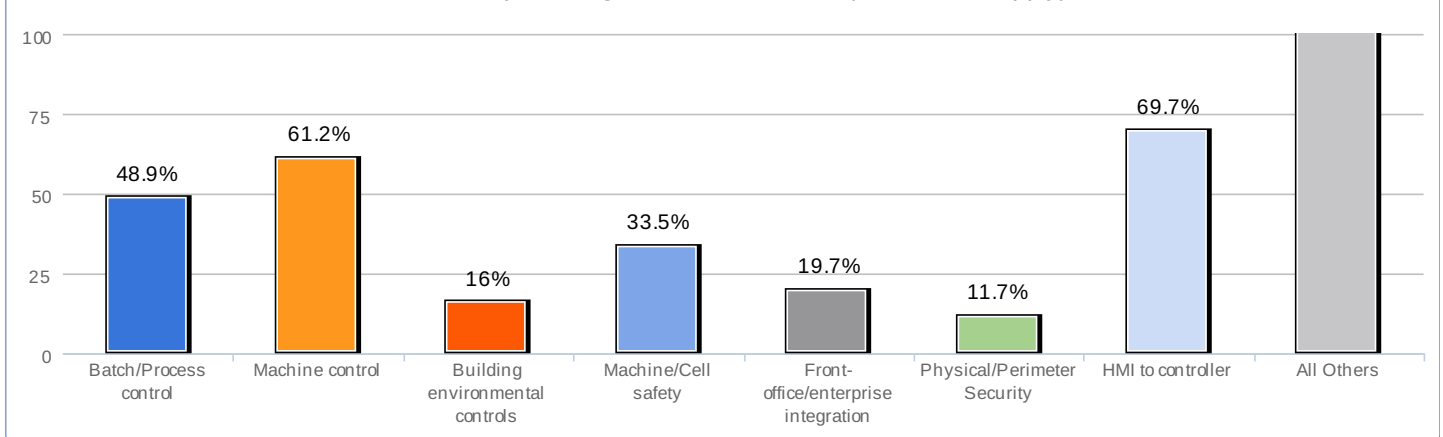
1. Do you recommend, specify or purchase Industrial Ethernet equipment?



1. Do you recommend, specify or purchase Industrial Ethernet equipment?

| Value | Percent % |
|-------|-----------|
| Yes   | 90.0%     |
| No    | 10.1%     |

2. How are you using Industrial Ethernet? (Mark all that apply)

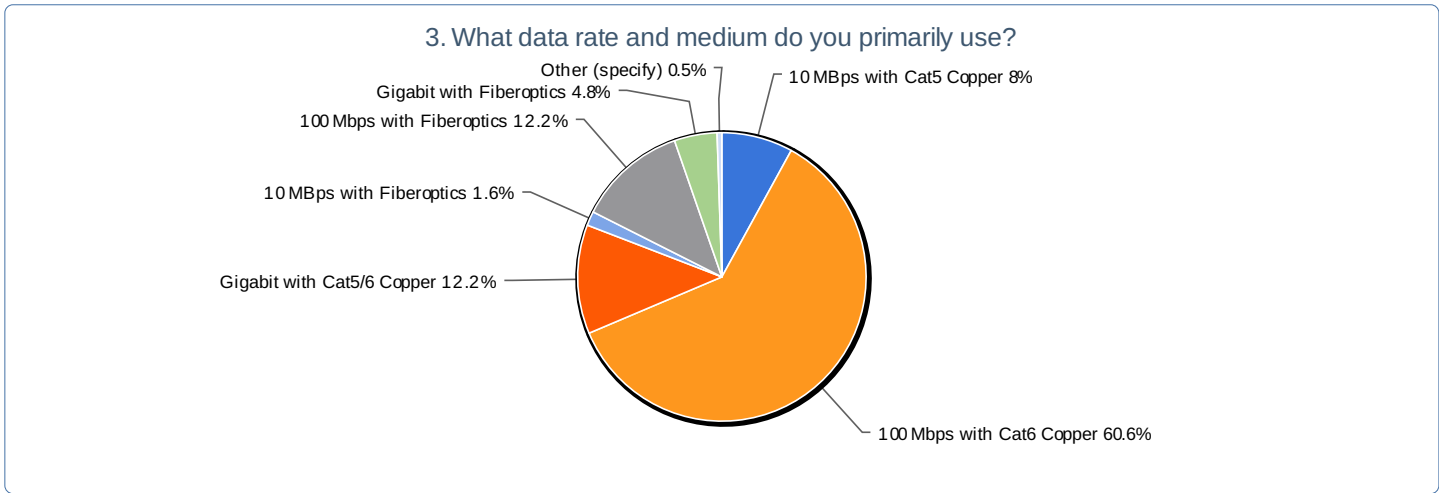


2. How are you using Industrial Ethernet? (Mark all that apply)

| Value                               | Percent % |
|-------------------------------------|-----------|
| Batch/Process control               | 48.9%     |
| Machine control                     | 61.2%     |
| Building environmental controls     | 16.0%     |
| Machine/Cell safety                 | 33.5%     |
| Front-office/enterprise integration | 19.7%     |
| Physical/Perimeter Security         | 11.7%     |
| HMI to controller                   | 69.7%     |
| Controller to controller            | 68.6%     |

|                             |       |
|-----------------------------|-------|
| Maintenance and diagnostics | 49.5% |
| Process Safety              | 36.2% |
| Electronic Drives           | 48.4% |
| Device-Level Network        | 35.6% |
| Other (please specify)      | 3.2%  |

| Open-Text Response Breakdown for "Other (please specify)" |
|---|
| Left Blank  |
| Media Management & Storage                                |
| RTU   |
| Utilities, Power Meters & iMCC                            |
| electrical device integration                             |
| research purposes only                                    |

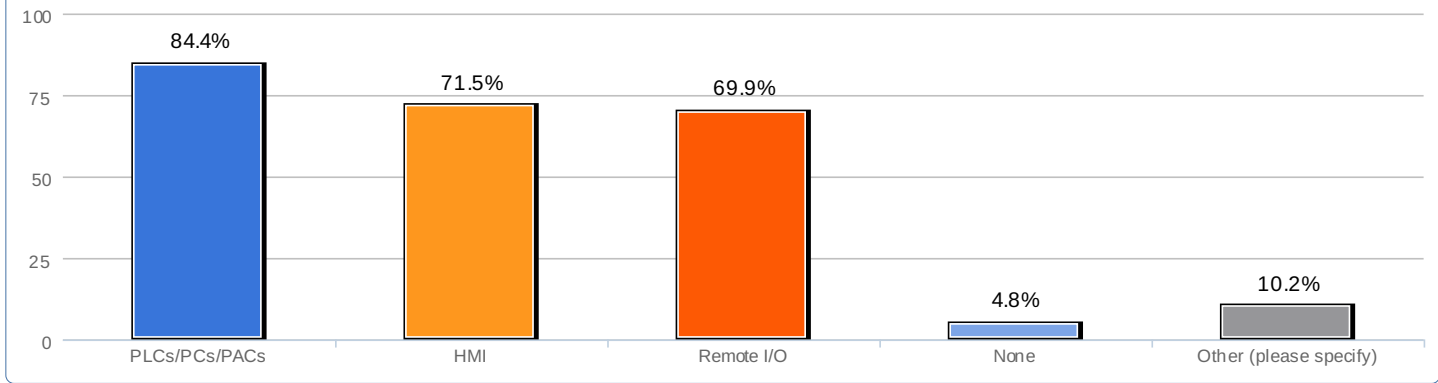


3. What data rate and medium do you primarily use?

| Value                      | Percent % |
|----------------------------|-----------|
| 10 MBps with Cat5 Copper   | 8.0%      |
| 100 Mbps with Cat6 Copper  | 60.6%     |
| Gigabit with Cat5/6 Copper | 12.2%     |
| 10 MBps with Fiberoptics   | 1.6%      |
| 100 Mbps with Fiberoptics  | 12.2%     |
| Gigabit with Fiberoptics   | 4.8%      |
| Other (specify)            | 0.5%      |

| Open-Text Response Breakdown for "Other (specify)" |
|--|
| 100Mbps with Cat5 Copper                           |

4. What type of Industrial Ethernet-enabled equipment do you plan to install in the next 18 months? (Mark all that apply)



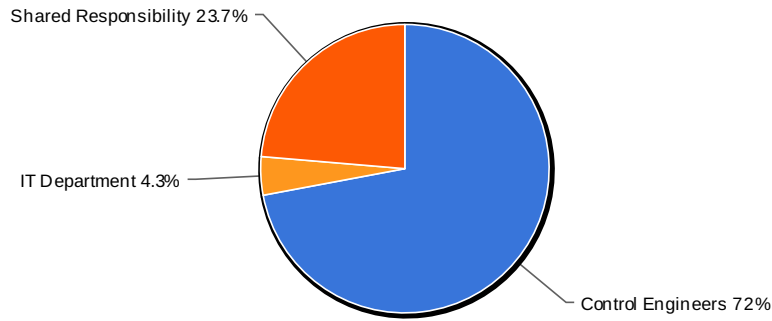
4. What type of Industrial Ethernet-enabled equipment do you plan to install in the next 18 months? (Mark all that apply)

| Value                  | Percent % |
|------------------------|-----------|
| PLCs/PCs/PACs          | 84.4%     |
| HMI                    | 71.5%     |
| Remote I/O             | 69.9%     |
| None                   | 4.8%      |
| Other (please specify) | 10.2%     |

Open-Text Response Breakdown for "Other (please specify)"

- Left Blank
- AC Drives
- DCS controllers
- Drives
- Drives, Cameras, Robots
- Drives, Vision
- Electronic Drives
- Full DCS replacement
- I don't know of any plans for the short term.
- IP Cameras
- Linking Devices & DCS
- Motion Control
- Safety PLC, Drives
- device-layer equipment
- electronic instrumentation
- wifi hubs

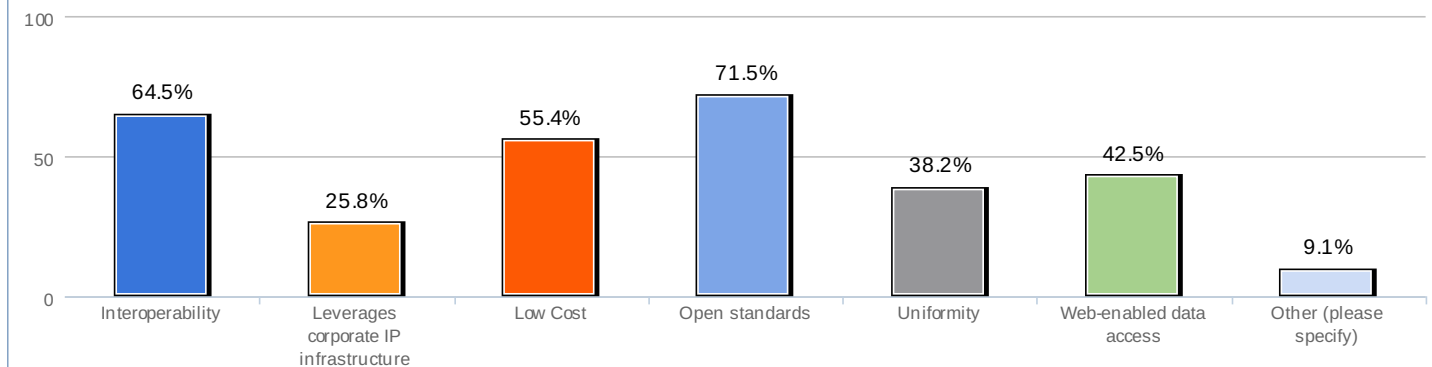
5. What group has primary responsibility for Industrial Ethernet projects?



5. What group has primary responsibility for Industrial Ethernet projects?

| Value                 | Percent % |
|-----------------------|-----------|
| Control Engineers     | 72.0%     |
| IT Department         | 4.3%      |
| Shared Responsibility | 23.7%     |

6. What benefits of Industrial Ethernet interest you the most? (Mark all that apply)



6. What benefits of Industrial Ethernet interest you the most? (Mark all that apply)

| Value                                 | Percent % |
|---------------------------------------|-----------|
| Interoperability                      | 64.5%     |
| Leverages corporate IP infrastructure | 25.8%     |
| Low Cost                              | 55.4%     |
| Open standards                        | 71.5%     |
| Uniformity                            | 38.2%     |
| Web-enabled data access               | 42.5%     |
| Other (please specify)                | 9.1%      |

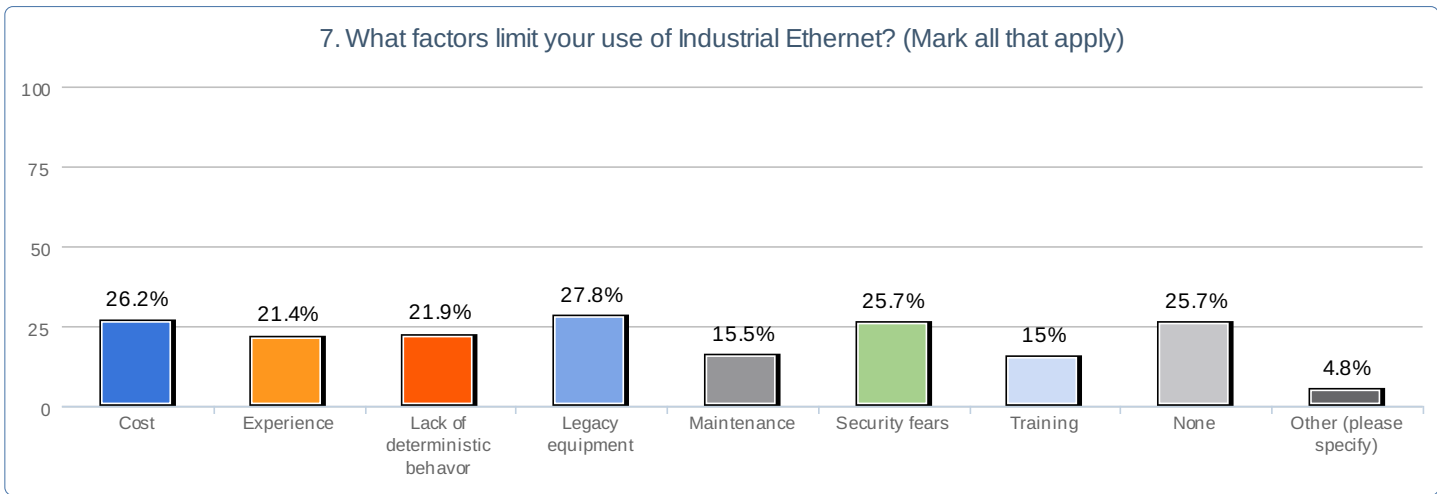
Open-Text Response Breakdown for "Other (please specify)"

Left Blank

Determinism

FDT, Convergence, Architecture, Cyber-Security

|  |
|--|
| Flexible Programming                                 |
| High speed   |
| One Network Cable for all communications             |
| Speed  |
| Speed, realtime                                      |
| Synchronisation                                      |
| Wiring cost saving                                   |
| communication speed                                  |
| ease of use  |
| easy and flexibility in creating system architecture |
| easy to use / configure                              |
| none   |
| reduced I/O interfaces                               |
| will be available longer than proprietary networks   |



7. What factors limit your use of Industrial Ethernet? (Mark all that apply)

| Value                          | Percent % |
|--------------------------------|-----------|
| Cost                           | 26.2%     |
| Experience                     | 21.4%     |
| Lack of deterministic behavior | 21.9%     |
| Legacy equipment               | 27.8%     |
| Maintenance                    | 15.5%     |
| Security fears                 | 25.7%     |
| Training                       | 15.0%     |
| None                           | 25.7%     |
| Other (please specify)         | 4.8%      |

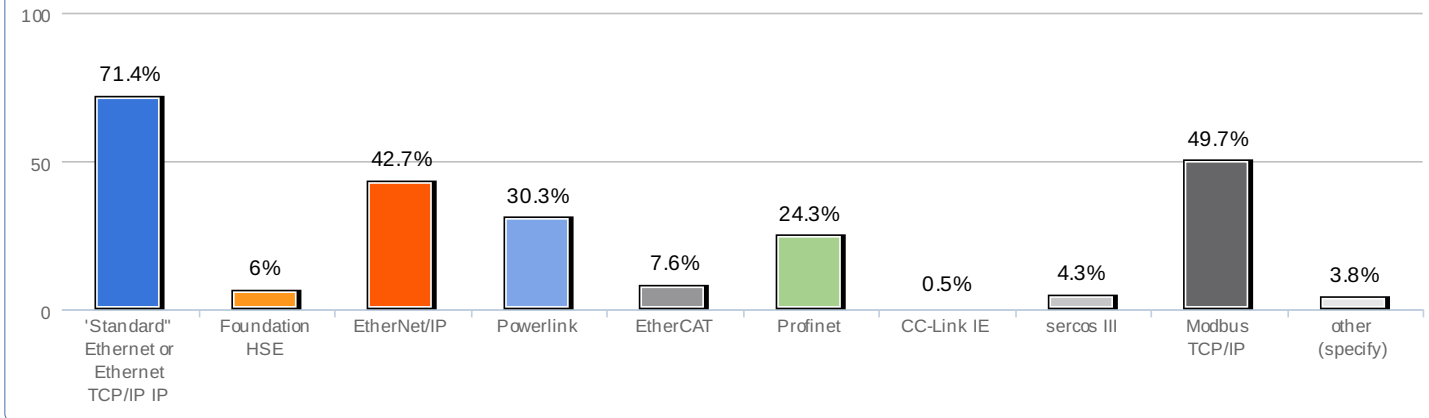
Open-Text Response Breakdown for "Other (please specify)"

|   |
|---|
| Left Blank  |
| Complexity (powered media converters), limited topology           |
| Customer specification, Ethernet feature availability on product. |
| Interference by IT  |



Isolating process control network from plant LAN  
 Lack of manufacturer support  
 Misapplication of office-grade components  
 architectural constraints  
 open source  
 preference for reliable redundant networks

8. Do you use these "flavors" of Industrial Ethernet? (Mark all that apply)



8. Do you use these "flavors" of Industrial Ethernet? (Mark all that apply)

| Value                                     | Percent % |
|---|-----------|
| 'Standard' Ethernet or Ethernet TCP/IP IP | 71.4%     |
| Foundation HSE                            | 6.0%      |
| EtherNet/IP                               | 42.7%     |
| Powerlink                                 | 30.3%     |
| EtherCAT                                  | 7.6%      |
| Profinet                                  | 24.3%     |
| CC-Link IE                                | 0.5%      |
| sercos III                                | 4.3%      |
| Modbus TCP/IP                             | 49.7%     |
| other (specify)                           | 3.8%      |

Open-Text Response Breakdown for "other (specify)"

Left Blank  
 BACnet  
 DNP-3, IEC-61850, BACnet  
 DeltaV PCN  
 TCnet  
 VnetIP  
 Yokogawa's Vnet/IP  
 open safety

9. What is your job function?

|                                   | Control system design/engineering | Company management | Tech support | Research/development | Engineering | General Administration | Plant Operations | Research and Development |
|-----------------------------------|-----------------------------------|--------------------|--------------|----------------------|-------------|------------------------|------------------|--------------------------|
| <b>What is your job function?</b> | 42.0%                             | 9.0%               | 10.1%        | 4.8%                 | 25.5%       | 2.1%                   | 4.8%             | 1.6%                     |

10. What is your machine builder industry?

|   | Process Industries end user | Discrete Industries end user | Industrial machine builder | System integrator working mostly with process industry end users | System integrator working mostly with discrete industry end users | System integrator working with both process and discrete |
|---|-----------------------------|------------------------------|----------------------------|--|---|--|
| <b>What is your machine builder industry?</b> | 31.4%                       | 5.4%                         | 30.3%                      | 8.1%   | 5.9%  | 18.9%  |