

An Evaluation of the
sensor market
among design engineers

February 2010

Conducted by:



Conducted for:



Introduction and Methodology

Background and Objectives

This research was conducted by Reed Business Information Boston Research Group on behalf of **Design News** magazine to better understand the sensor market among design engineers.

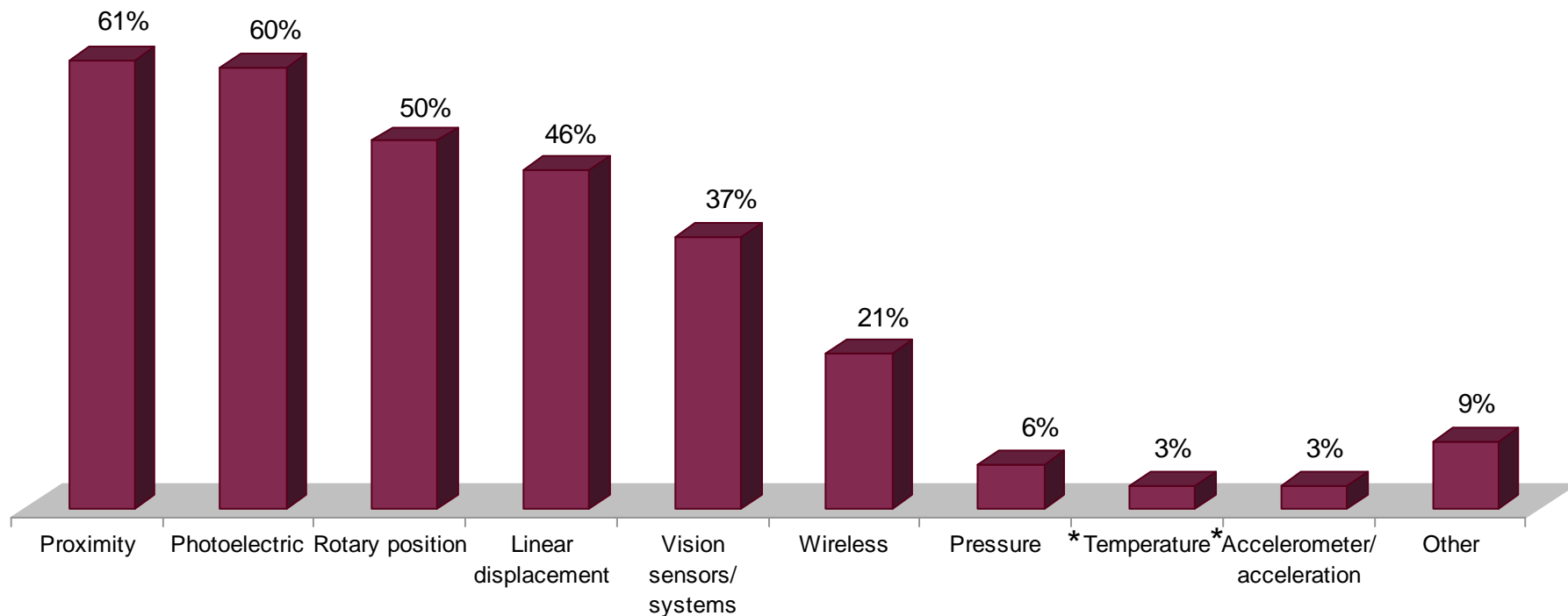
❖ *Objectives:*

- Types of sensors involved with
- The importance of various types of sensors
- Emerging sensor technologies and applications
- Network protocols used today and in the future
- Importance attributes when selecting sensors
- Importance attributes when selecting a sensor supplier
- Future sensor usage
- Types of information needed to accommodate sensor challenges
- Applications using or planned usage of sensors
- Engineering disciplines
- Employee size

❖ *Methodology:*

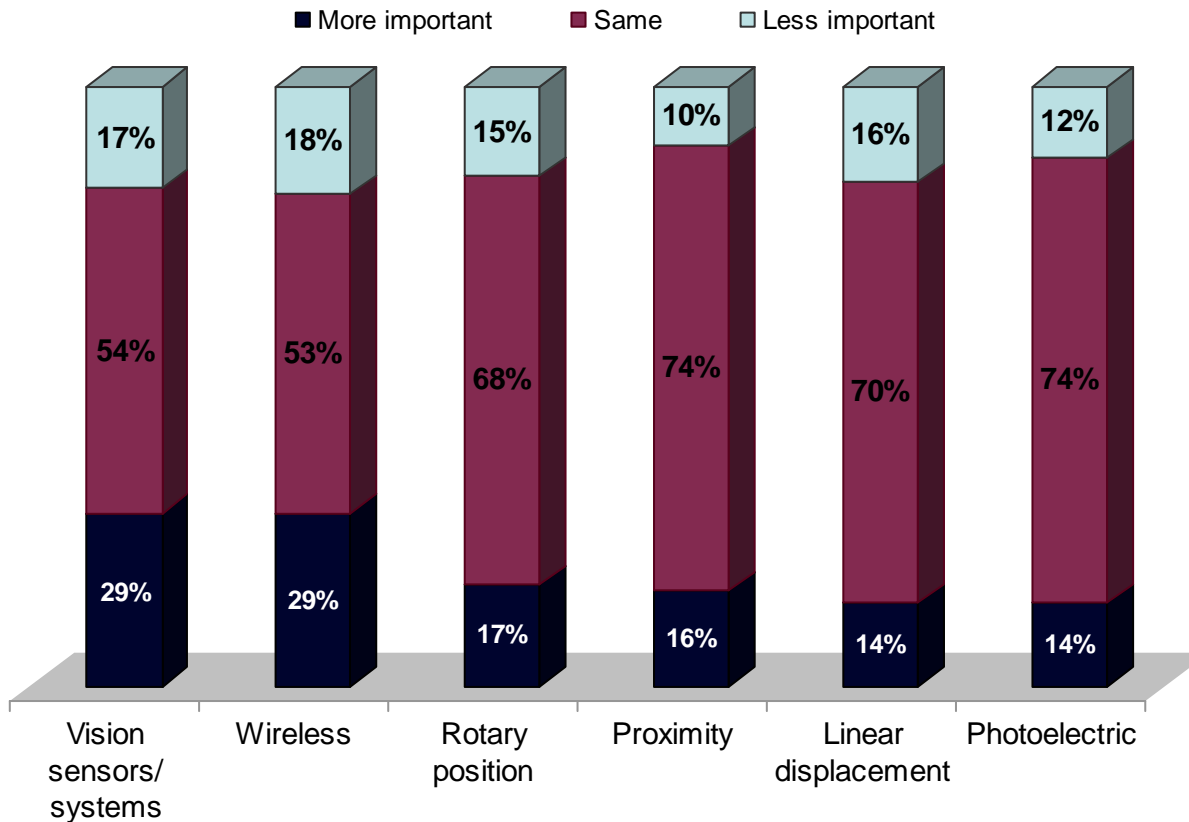
- Survey method: 22,000 subscribers of Design News who specify sensors were sent an email survey on January 26th and 28th
- Field: January, 2010
- Response: 610 completed surveys
- Margin of error: +/- 4% at a 95% confidence level

In your work, which of the following sensor categories do you specify, buy, approve, or otherwise influence the purchase of?

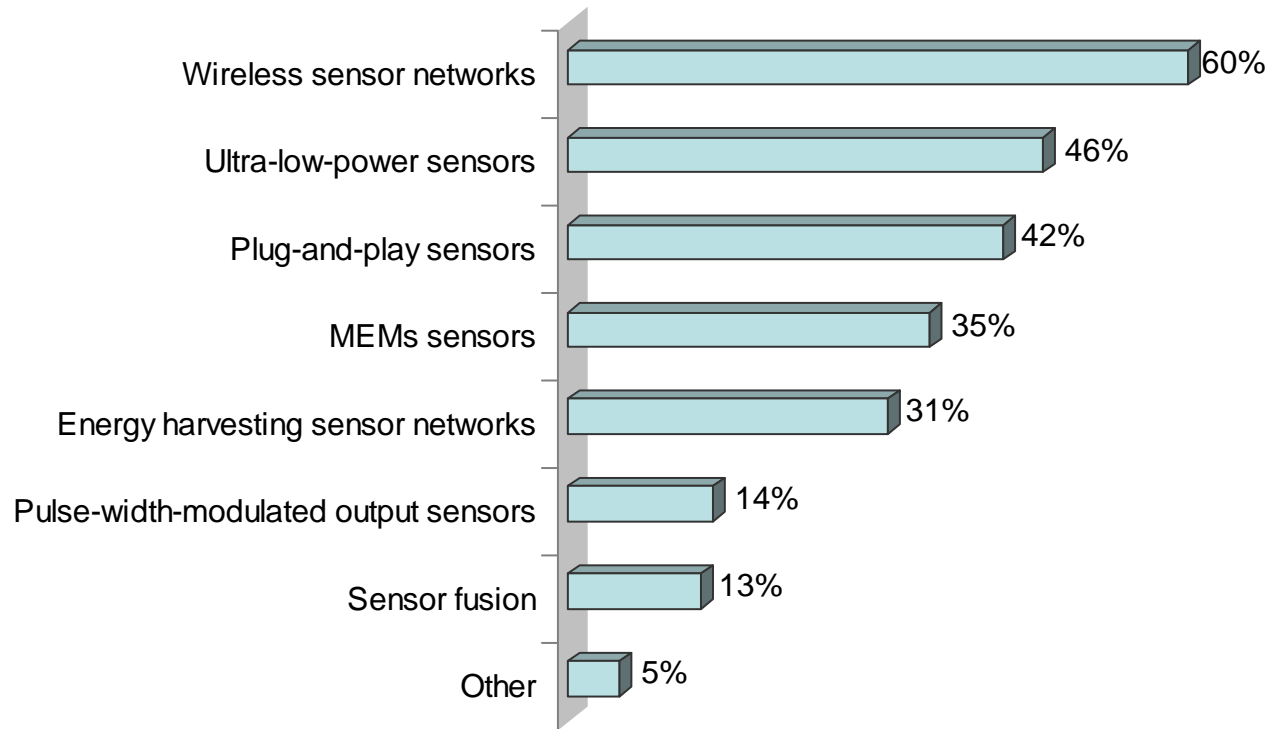


** Included in 'Other' category*

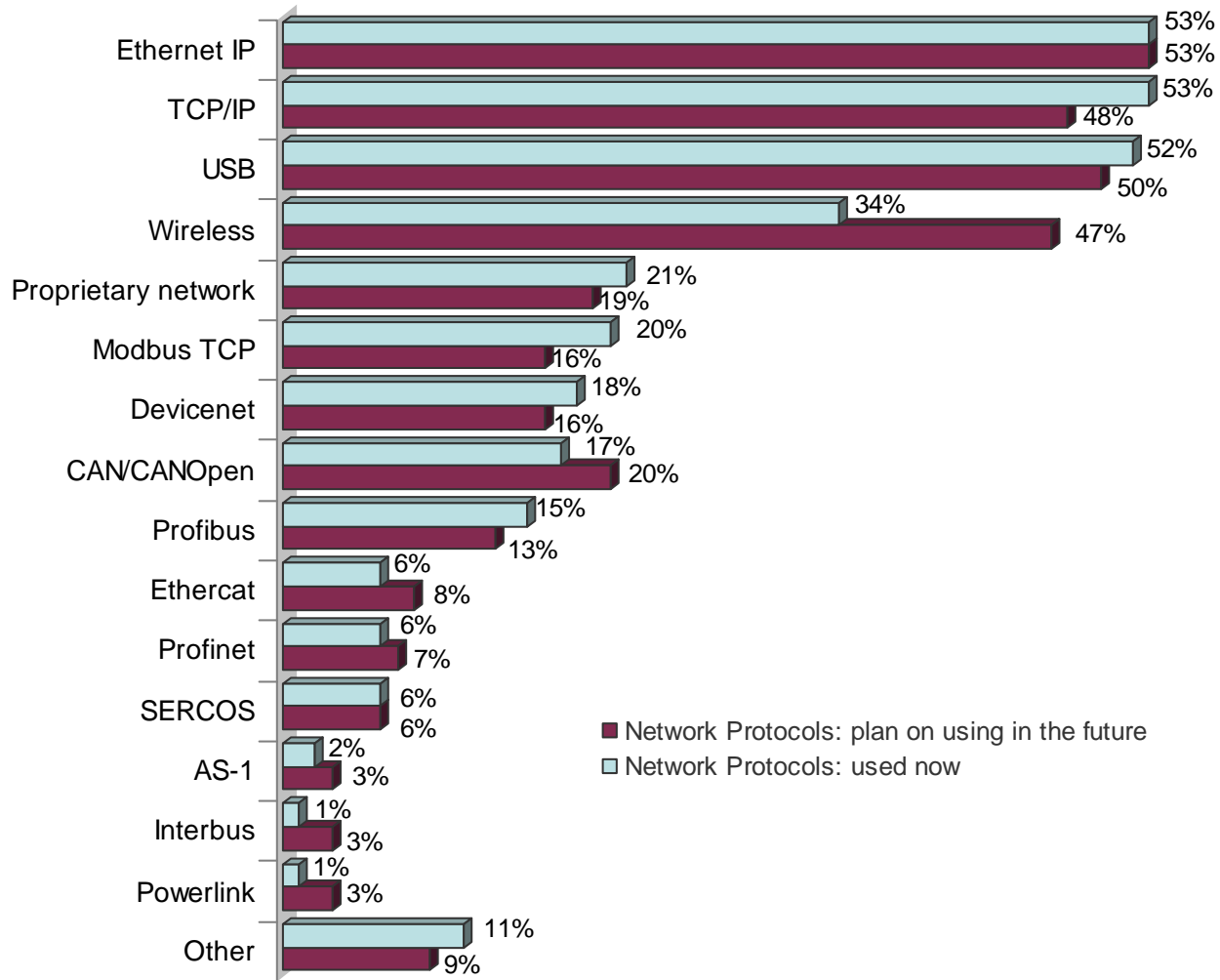
For the next 12 months, how will the following sensor products change in importance to you?



What sensor technologies and applications do you see as emerging or increasing in importance in the next 18 – 24 months?



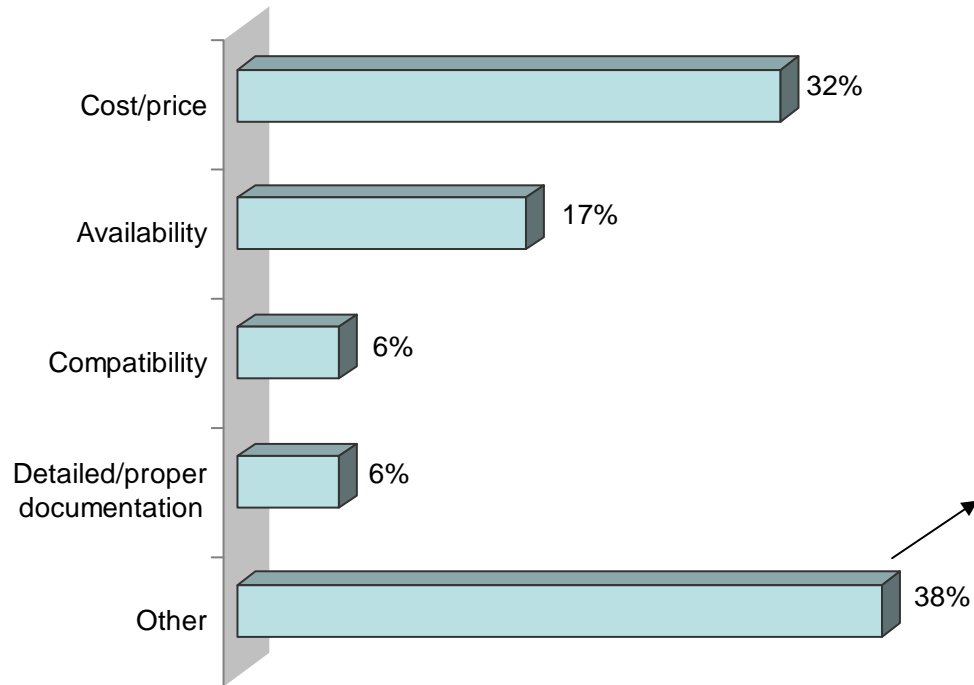
What network protocols do you use now? What network protocols do you plan to use in the future?



When selecting a sensor for use in your design, how important are the following characteristics?

	Extremely/Very Important	Somewhat Important	Not very/at all Important
Reliability	91%	8%	2%
Accuracy	77%	20%	3%
Durability/ruggedness	77%	19%	4%
Noise immunity	67%	27%	7%
Sensitivity	65%	31%	4%
Sensing range	63%	31%	7%
Resolution	62%	34%	5%
Ease of maintenance	56%	33%	11%
Ease of setup	54%	37%	9%
Environmental protection	53%	33%	15%
Range	51%	38%	10%
Size	45%	42%	14%
Self-calibration	44%	36%	19%
Connection options	36%	45%	18%
Diagnostic features	35%	42%	23%
Power consumption	32%	35%	34%

Anything else important? (unaided)



- *Appropriate sensor for medical device (60601 compliant, etc).*
- *Approved vendor list*
- *Calibration frequency*
- *Custom solutions when necessary. High-flex cabling*
- *Data acquisition rate, radiation hardness, temperature operating range*
- *Dust imperviability*
- *Global use 230VAC 50/60hz*
- *Immunity to corrosive liquid*
- *Interface to voltage sensing Burk remote controls*
- *Interfacing various data rates with sensor fusion*
- *Low probability of false alarms*
- *Mechanical ruggedness against shock--rated as a 5*
- *Mounting (or is that part of ease of setup)*
- *Optical coupling*
- *Response Time*
- *Robustness vs. high vibration environment (2 mentions)*
- *RoHS compliant, WEEE compliant*
- *Sensor size, component to component consistency*
- *Standard connections*
- *Temperature range, effect of vacuum, non-shock G-force*
- *Trusted, knowledgeable distributor*
- *Warranty and backup support from manufacturer*
- *Weight*

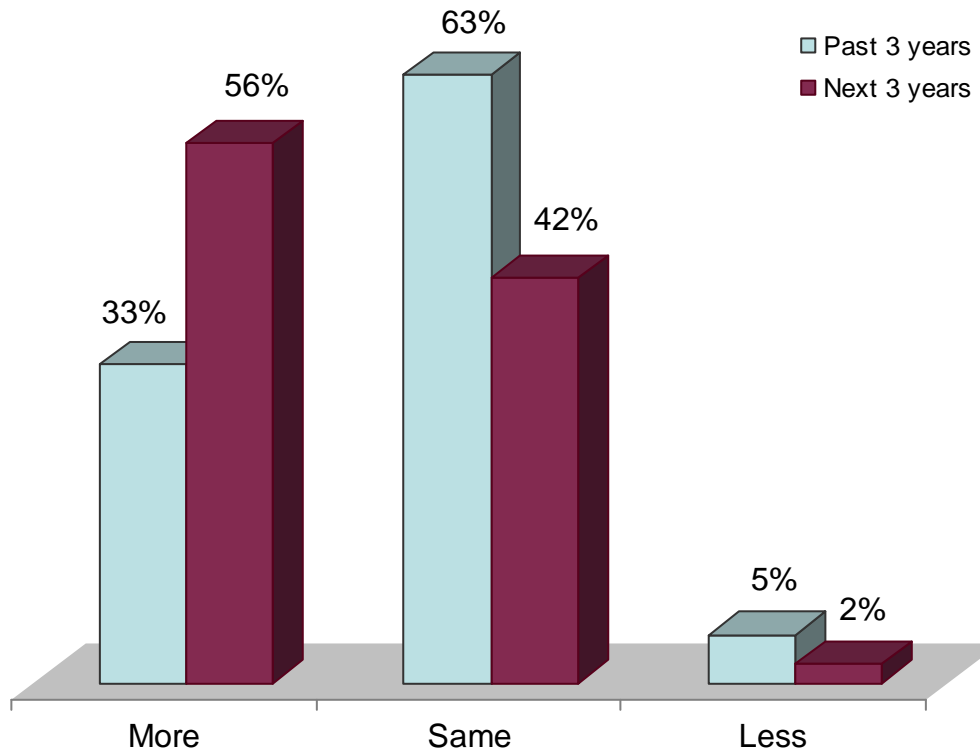
When choosing a particular sensor supplier, how important are the following factors?

	Extremely/Very Important	Somewhat Important	Not very/at all Important
Availability	81%	18%	2%
Product support	68%	28%	4%
Product features	61%	32%	6%
Application engineering assistance	58%	34%	9%
Price	56%	34%	10%
Service	53%	33%	13%
On approved vendor list	32%	30%	38%
Done business with supplier before	31%	39%	30%
Sampling policy	30%	41%	29%
Breadth of sensor line	28%	45%	28%
Training	26%	40%	34%

Is there anything else important?

- “Customization for application.”
- “Documentation of specifications.”
- “Environmental specifications”
- “Friendly sales reps being available to help.”
- “Innovation and reliability”
- “It has to WORK!”
- “Local or foreign”
- “ON-TIME delivery, ability to stock large quantities.”
- “Past experience.”
- “Product roadmap (i.e. future) lines up with our needs.”
- “Quality control, process stability”
- “Quality of product line.”
- “Quality/Reliability of Sensors.”
- “Reputation”
- “Small quantity availability”
- “Warranty”
- “What we order is what we want.”
- “Willingness to reasonably accept returns of products that did not fit to the application.”
- “Willingness to work with new customers/applications.”

How has or will the use of sensors in your designs change in the future?



Top Ten Challenges Faced

- 1 Technical documentation/data specs/application notes: (n=33)**
 - *“Reliable data sheets on new products and believable projected availability lifetimes.”*
 - *“Sometimes we have no experience with a particular type of sensor (or engineering device) and don’t know the jargon. We don’t know the strengths, weaknesses or limitations. A good vendor will have enough information in their sales literature to teach us what their sensor is all about, what it can do, and how to hook it up. But a bad vendor will lack or have misleading information.”*
 - *“Technical application worksheets (from design to practical assembly and use).”*
 - *“Whether laboratory specs of a particular sensor will really meet the ‘real world’”.*
- 2 Understanding the application of a sensor/finding correct sensor: (n=21)**
 - *“Finding all the best features and how to use them most effectively in applications.”*
 - *“Finding appropriate specialty sensors (and amplifiers/recording equipment/accessories) for quick-turn custom projects.”*
 - *“Finding the correct sensor to meet the specific application need.”*
- 3 Integration/compatibility: (n=11)**
 - *“Difficult placement when adding sensors to preexisting equipment.”*
 - *“Integration of new technologies into existing systems.”*
 - *“Compatibility with other hardware not of the same manufacture.”*
- 4 Environmental issues: (n=10)**
 - *“The sensor’s environment is brutal. It’s hot, abrasive, and high pressure. Materials and construction has been trial and error. Nobody has done it before.”*
 - *“Sensor degradation due to ambient parameters, humidity, pollutants, etc.”*
 - *“Environmental capabilities like extreme temperature range, vibration and shock capabilities.”*
- 5 Reliability: (n=10)**
 - *“Getting reliability information on the newest sensors. They have the most/best features but no idea how reliable they might actually be.”*
 - *“Long-term reliability of new designs.”*

*n = number of mentions

When thinking about sensors what is the most challenging issue that you face that is most difficult to get helpful information on?

Top Ten Challenges Faced *(continued)*

6 **Technical/customer support:** (n=9)

- *“Getting honest feedback from suppliers when their sensors will NOT work in the application that we plan to use them.”*
- *“Getting technical info from manufacturer’s and suppliers websites. Also, finding the manufacturer on the web without going through a second or third party.”*
- *“It is usually too hard to find a knowledgeable person to answer phone calls about specific technical questions about their products.”*

7 **Cost:** (n=9)

- *“How to find low-cost sensors that are used in high volume elsewhere. Our company generally buys in low volumes, and may suppliers will not give us the time of day.”*
- *“Finding affordable sensors that work in harsh chemical environments.”*
- *“Right functionality with good pricing.”*

8 **Performance:** (n=8)

- *“Long term stability and thermal performance information.”*
- *“Technical performance in out unusual applications.”*

9 **Durability:** (n=8)

- *“Real numbers of field service life and durability – not just design goal info or theoretical estimates.”*
- *“Finding a sensor that is durable, has the input voltage/output signal required, measurement range required, that is available in less than a year and for a reasonable price that most importantly will last 100’s of millions of cycles.”*

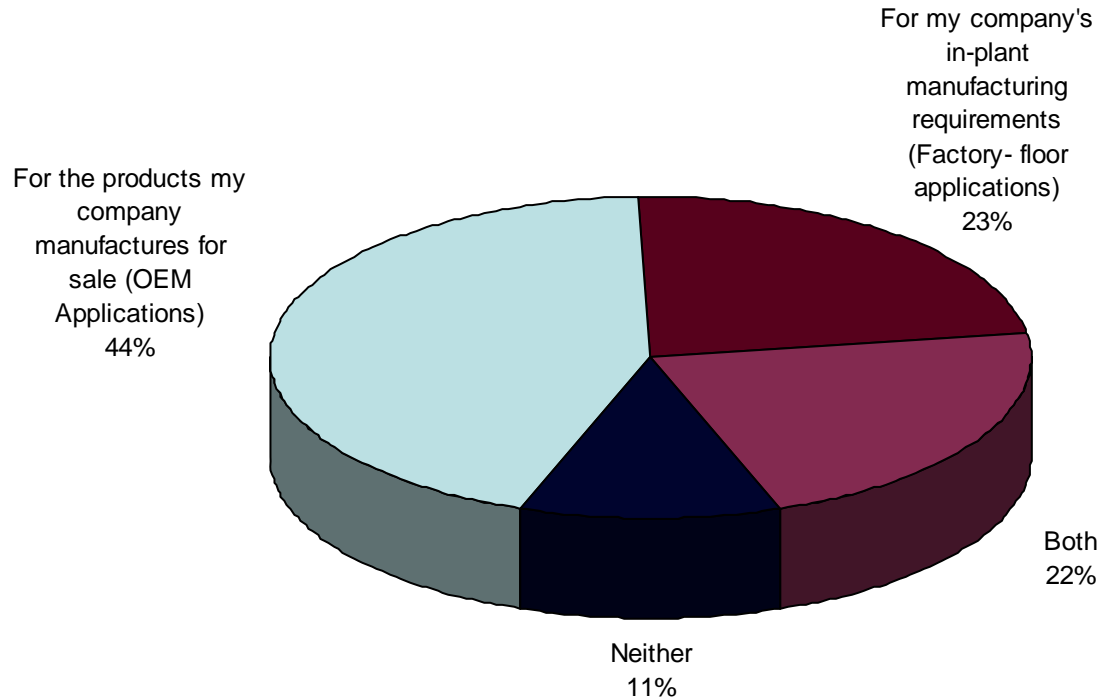
10 **Availability:** (n=8)

- *“Availability. Too many manufacturers design parts only to wait for orders then build to demand. Anticipate the market, design parts that do one job, limit the ancillary functions and have the part in stock BEFORE announcing the product!”*
- *“How long the product will be available/ end-of-life notification.”*

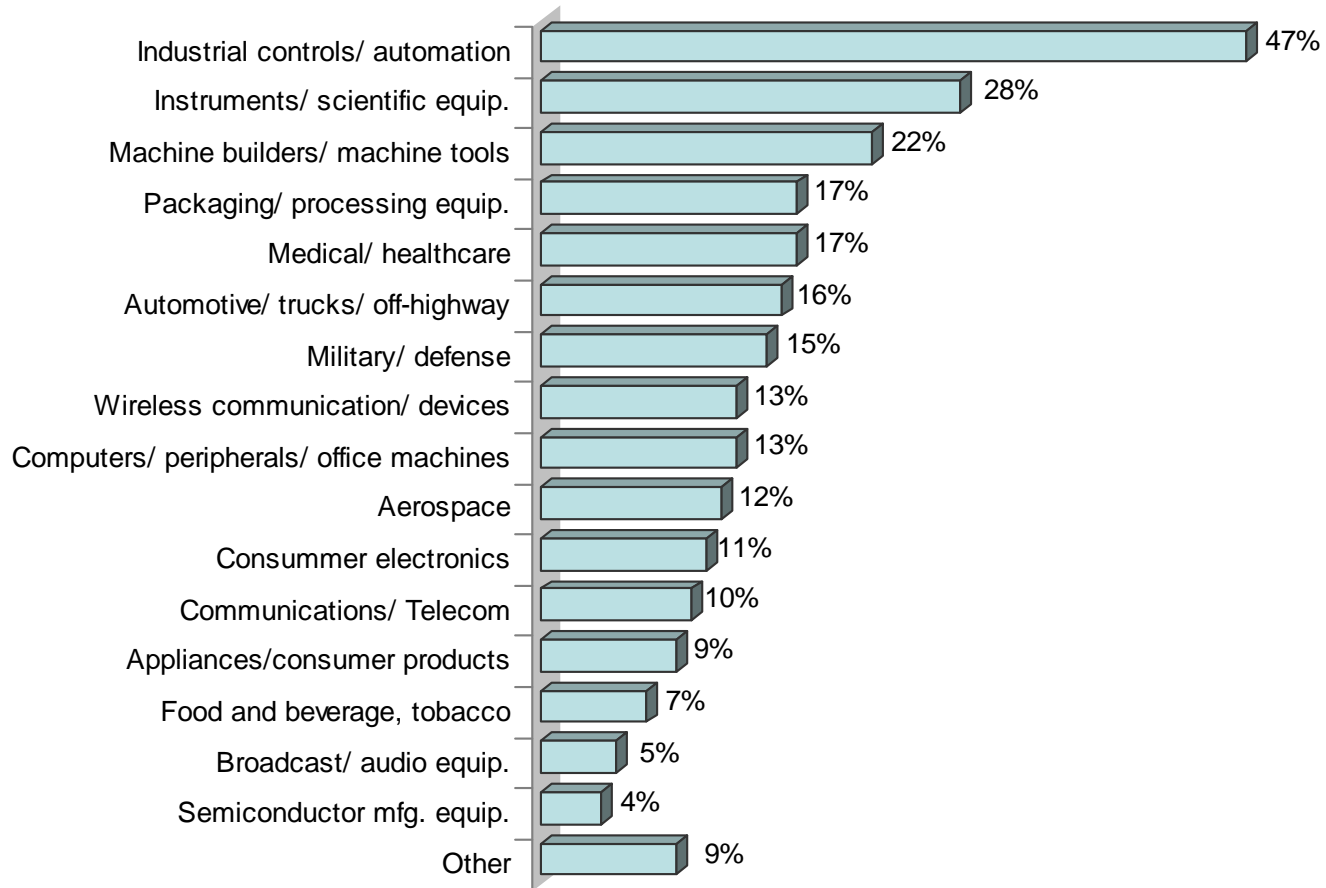
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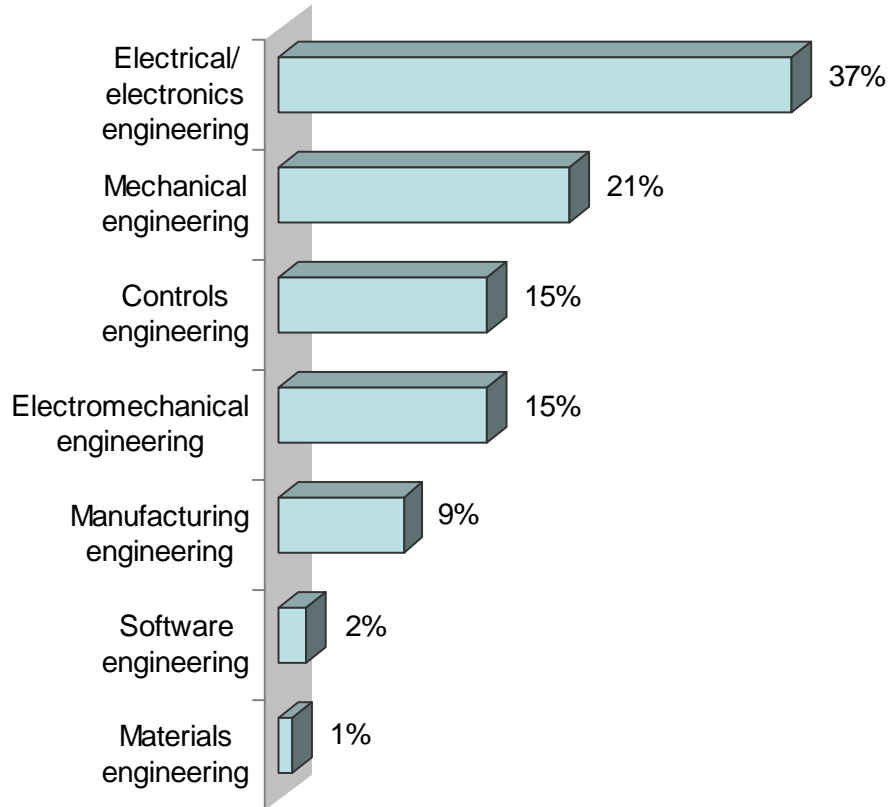
For which of the following do you apply sensor technology?



Which of the following best describe applications and/or markets in which you currently employ or plan to employ sensors?



Which of the following best describes your primary engineering discipline?



How many people are employed at your location?

