control design

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Sensors & Vision

October 2012
Market Intelligence Report

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Executive Summary

An electronic survey of *Control Design* readers was conducted in October 2012 in order to identify usage and application trends of **sensors and vision** among the industrial machine builders that comprise *Control Design*'s readership. Detailed survey results are presented on the pages that follow, with key findings summarized below:

- Nearly 70% of respondents indicated they use inductive proximity sensors, 59% use process variable sensors, 53% use rotary encoder/resolver, 45% use capacitive proximity, 44% photoelectric and a further 44% linear position, 29% use vibration/condition monitoring, 27% use vision, and 23% use ultrasonic proximity.

- The use of hardwiring to connect sensors to I/O points was mostly commonly indicated with nearly 54% of respondents using hardwiring. 14% report using Ethernet/Ethernet variant, 13% employ a device-level digital network, 11% IO-Link, 7% serial 232/422/485, and only 1% use a proprietary method.

- 40% of respondents report using machine vision-based sensing. Of those who do use vision-based sensing, 50% reported using vision for online inspection, 47% use it as feedback for real-time machine control, 3% for offline inspection.

- 39% of respondents that use machine vision are using all-in-one, integrated smart cameras. 23% are using vendor-built systems with camera frame grabber and processor, 18% are using integrator-built with camera frame grabber and processor, and 13% are using build it yourself with camera, frame grabber and processor.

Summary Report - Aug 29, 2012

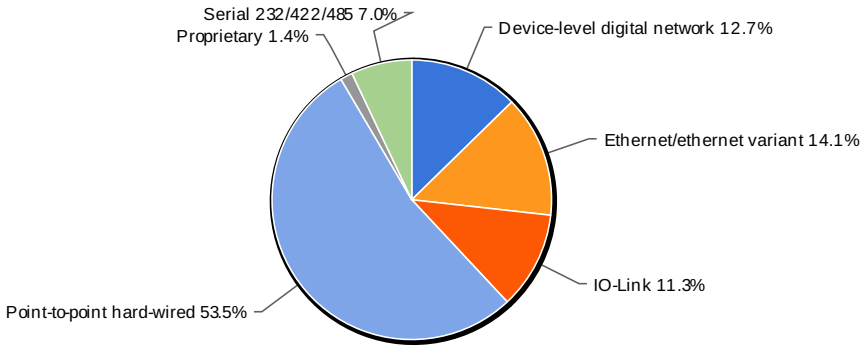
Survey: 2012 CD MIR Sensors and Vision

Q 1. Which of these types of sensors do your machines use?

Value	Percent %
Capacitive proximity	45.2%
Inductive proximity	68.5%
Ultrasonic proximity	23.3%
Photoelectric	43.8%
Linear position	43.8%
Rotary encoder/resolver	53.4%
Process variable sensors (temperature, pressure, flow, weight etc.)	58.9%
Vibration/condition monitoring	28.8%
Vision	27.4%
Color	11.0%
Other (please specify)	1.4%
Optical laser	20.6%

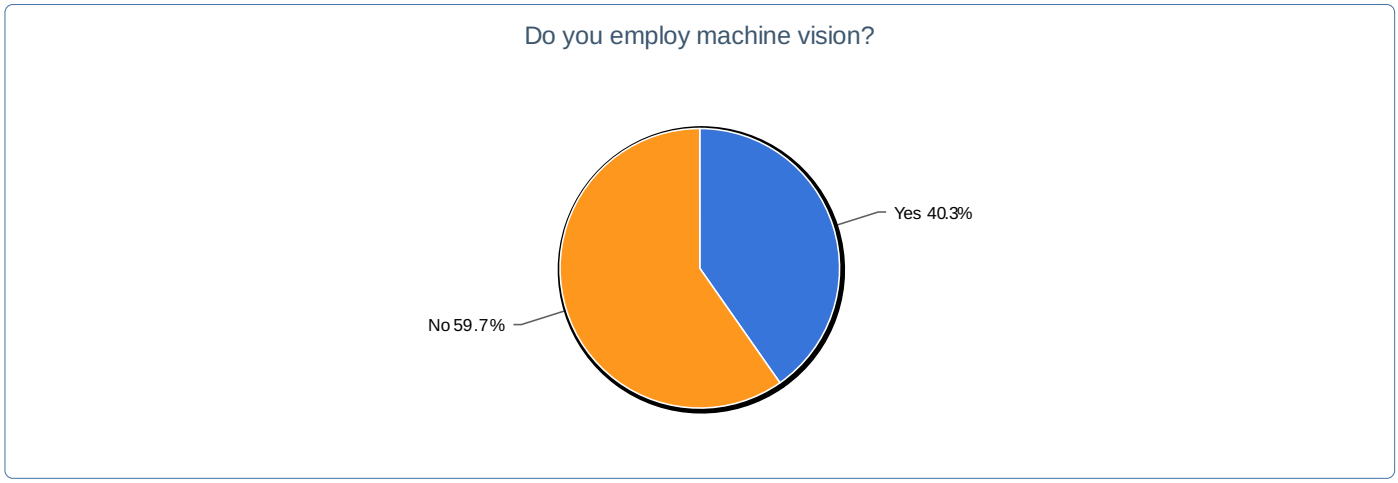
Open-Text Response Breakdown for "Other (please specify)"
PHM sensors, smart sensors

How are they most often connected to the I/O?



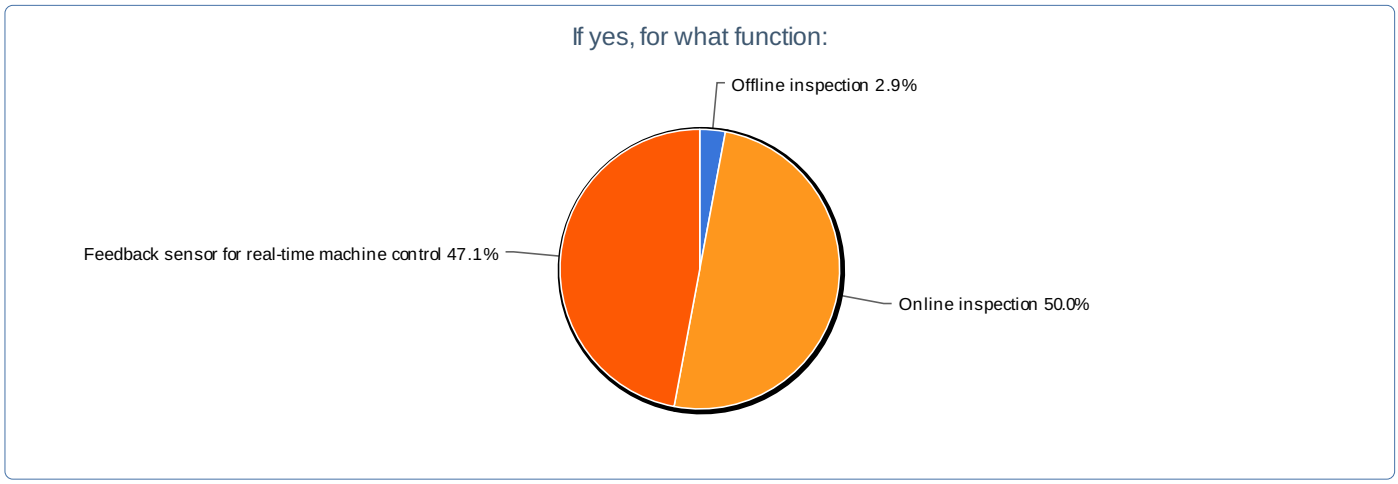
How are they most often connected to the I/O?

Value	Percent %
Device-level digital network	12.7%
Ethernet/ethernet variant	14.1%
IO-Link	11.3%
Point-to-point hard-wired	53.5%
Proprietary	1.4%
Serial 232/422/485	7.0%
Other (please specify)	0.0%



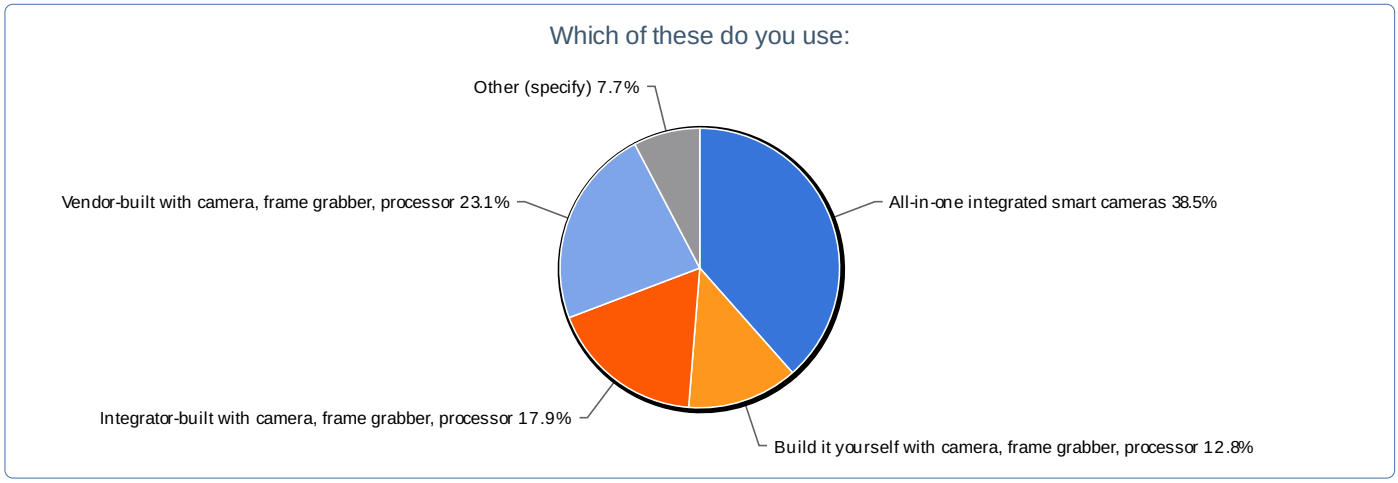
Do you employ machine vision?

Value	Percent %
Yes	40.3%
No	59.7%



If yes, for what function:

Value	Percent %
Offline inspection	2.9%
Online inspection	50.0%
Feedback sensor for real-time machine control	47.1%
Other (specify)	0.0%



Which of these do you use:

Value	Percent %
All-in-one integrated smart cameras	38.5%
Build it yourself with camera, frame grabber, processor	12.8%
Integrator-built with camera, frame grabber, processor	18.0%
Vendor-built with camera, frame grabber, processor	23.1%
Other (specify)	7.7%

Open-Text Response Breakdown for "Other (specify)"
Customer built- various configurations
none

What is your machine builder industry?

	Assembly	One-off Custom	Packaging	Electronics Pick and Place	Machining Centers	Semiconductor Tools	Paper Industry	Printing and Converting	Rolling Mills	Metalworking	Woodworking	Materi Handling/Tr Syster
What is your machine builder industry?	**10.0%**	**7.1%**	**8.6%**	**1.4%**	**0.0%**	**0.0%**	**4.3%**	**1.4%**	**1.4%**	**14.3%**	**0.0%**	**10.0%**

Open-Text Response Breakdown for "Other (please specify)"	Count
Abrasive Finishing	1
Food Processing Machines	1
Metal Stamping Industry	1
Oceanographic	1
Power	1
Process Fluid Temperature Control	1
Safety Assessment	1
Water Treatment	1
aluminum smelter	1
gas &oil production	1
pharma and chemical industry	1
plastics machinery	1

What is your job function?

	Control system design/engineering	Company management	Tech support	Research/development	Other (specify)
What is your job function?	**61.6%**	**11.0%**	**6.8%**	**16.4%**	**4.1%**

Open-Text Response Breakdown for "Other (specify)"	Count
Machine Design	2
consultant	1