

2.10 Interview contractors and installers to determine installation and commissioning issues, such as times and costs, and to identify other possible technology, market and application barriers to use of the control technologies under investigation (occupancy sensors, photosensors, dimming electronic ballasts).

The LRC decided to conduct a direct-mail survey to contractors and control installers to try to identify market barriers affecting the acceptance of lighting controls. The results of the survey are described below.

Direct-Mail Contractor Survey

Executive Summary

This report represents the results of a direct-mail survey conducted from May 15 to June 15, 2001, by the Lighting Research Center. The purpose of the survey was to determine contractors' and controls installers' attitudes about market barriers affecting the acceptance of lighting controls.

This survey confirmed overall what the industry already knows about lighting controls. Two significant results were quite clear:

- The potential market for occupancy sensors, photosensors, and dimming electronic ballasts is much greater than the present market. Installers were willing across the board to say that they could install far more controls than they do, if there were no barriers to market penetration.
- The universally cited barrier to market penetration was lack of customer demand, as expected. Although not directly asked, installers responded that they had difficulty proving that customers would see the payback from lighting controls.

Other market barriers seem relatively unimportant to this group:

- Lighting controls do not seem to cost installers much difficulty, either for time to install, or from returning to the job to adjust the controls. Everyone who completed the surveys commissions as well as installs the controls, so it can be assumed that all the installers are familiar with problems that arise in commissioning.
- Neither difficulty in finding skilled labor, nor a lack of compatible products seem to affect the number of controls this group installs. The majority of installers rate these barriers as "low" in importance across all types of controls, with only a few rating them "medium."
- Information about profitability was unclear; most installers have not broken out the cost of individual controls, as they use fixed contract pricing. However, for all four types of lighting controls, low profitability was cited as a major barrier no more than 20% of the time.

The results of this survey seem to show that customers must first be convinced that lighting controls will benefit their bottom line. If that happens, little else remains in the way of their widespread use.

Results for each type of lighting control are discussed in detail below.

Survey Demographics

The survey was mailed to 350 addresses obtained through the web sites of organizations whose members are likely to install lighting controls, including the following:

- National Association of Energy Service Companies
- National Association of Lighting Management Companies
- National Electrical Contractors Association
- New York Energy Efficiency Council
- Association of Energy Efficiency Engineers

Addresses were evenly distributed across the United States. As an incentive, installers received three Lighting Research Center publications of their choice if they returned the surveys. The response was 20 completed surveys, a return rate of approximately 5.7%. This return rate is in line with average return rates in direct-mail survey work. Note that not all installers who responded work with all types of lighting controls. Thus, the number of responses for each type of control can be less than the total number of surveys returned.

The surveys were more heavily returned from the eastern half of the U.S. Only one set of surveys came in from California, although 23 requests were sent. The rest of the surveys clustered in the Midwest and the upper South. No surveys came from the Northwest or Southwest. The distribution by state is given in Table 1.

Table 1: Each returned survey's state provenance

CA	KY	NC	TN
GA	MD	NH	TX
IA	MI	NY	VA
KS	MN	OH	WI
KS	MN	TN	WI

Finally, the addresses were evenly distributed in three categories. The first category was independent companies taken from the memberships described above, and the second and third categories were branch offices or affiliated installers from two major controls manufacturers, Siemens Building Technologies, Inc. and Johnson Controls, Inc. The returned surveys included approximately one-third independent companies and one-third each from Siemens and Johnson installers.

Dimming Electronic Ballasts

(12 responses)

The surveyed group installed relatively few dimming electronic ballasts in the last year, but the potential for increasing this type of control was high. Although 50% of the group installed fewer than 100 dimming ballasts, more than 40% thought that they could potentially install 1000 to 50,000 additional ballasts.

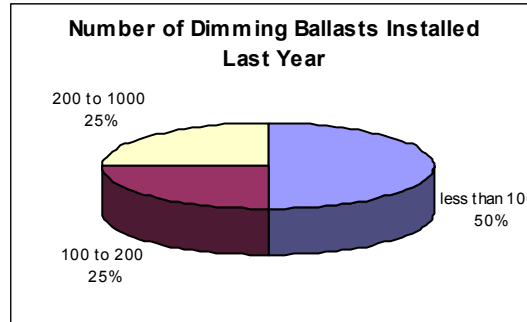


Figure 1: Percentage of installers who cite range of dimming ballasts installed last year.

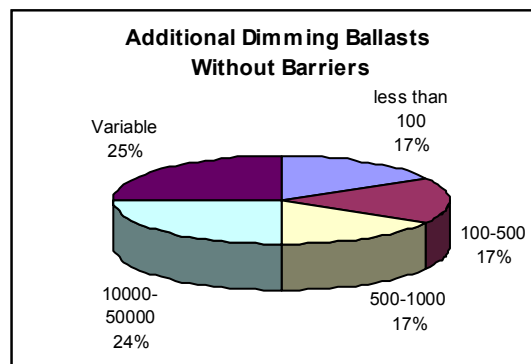


Figure 2: Percentage of installers who cite the range of additional dimming ballasts they could install if no barriers existed.

The major barrier holding back that number, they said, was lack of customer demand—73% of installers cited this barrier. One installer told us that it is “always difficult to obtain a good payback.” He also said, “Dimming controls have always been a compatibility problem.”

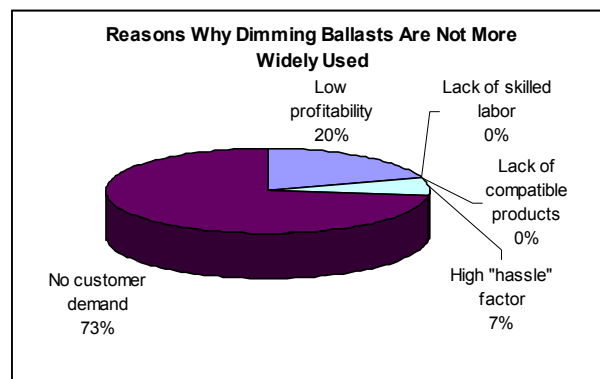


Figure 3: Percentage of installers who cite the importance of a reason for not using dimming ballasts as “high.”

Dimming ballasts were time-efficient to install, with 33% of installers able to complete installation in 30 minutes or less. An additional 25% could install a ballast in 30 to 60 minutes. The majority of installers charge for dimming ballasts by fixed contract price, with a number using hourly rate as the next most common method. Thus, the average charge they cited varied by contract as well. The most common brand of ballast they use was Advance (4 installers), while Lutron, Howard, and Motorola brands were also mentioned (1 installer each). About half say they sometimes use a different dimming ballast than the one specified by the engineer, architect, or designer.

Occupancy Sensors

(17 responses)

The surveyed group installed a relatively large number of occupancy sensors in the last year. Three installers (18%) put in 1000 or more, while four more (23%) installed between 200 and 1000 occupancy sensors. However, an equal number installed 100 or fewer occupancy sensors. Seven installers said that they use Watt-Stopper occupancy sensors, while SensorSwitch and WattMiser were each mentioned once. Again, about half of the installers say they sometimes use a different occupancy sensor than the one specified.

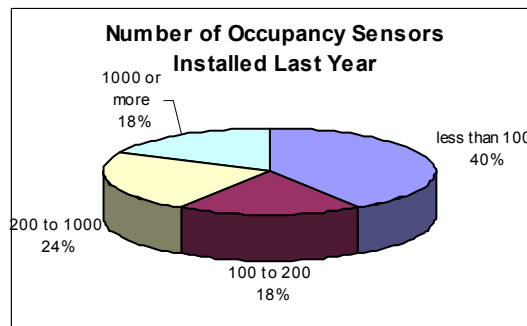


Figure 4: Percentage of installers who cite the range of occupancy sensors installed last year.

If no barriers existed, over 50% of installers feel they could put in anywhere from 500 to 50,000 additional occupancy sensors.

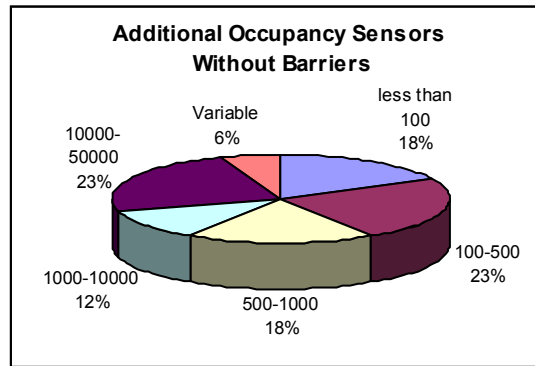


Figure 5: Percentage of installers who cite the range of additional occupancy sensors they could install if no barriers existed.

Lack of customer demand is the greatest barrier, but a high “hassle” factor with the sensors also interferes with growing the market for this type of lighting control. Comments about occupancy sensors from the installers included this: “It is difficult to measure exact savings and also more time-consuming to design, which are two reasons we do not propose them as often.” And another said, “[Our] biggest objections are based on poor past customer experience; it’s always difficult to predict accurate savings.”

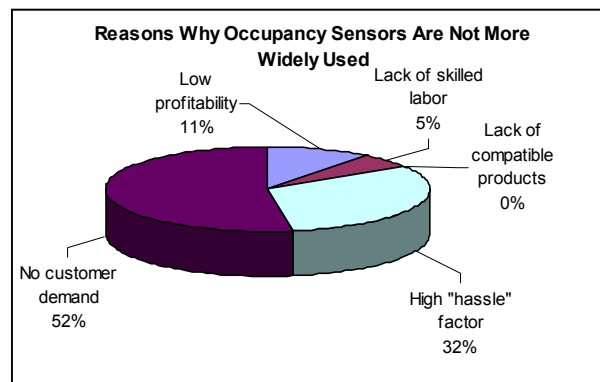


Figure 6: Percentage of installers who cite the importance of a reason for not using occupancy sensors as “high.”

It took most installers one to two or more hours to install an occupancy sensor. All respondents said that they themselves commissioned the sensors in addition to installing them. Customers did not often call them back to adjust the sensors once they were installed; 58% of installers say customers only call them back 1 to 10% of the time.

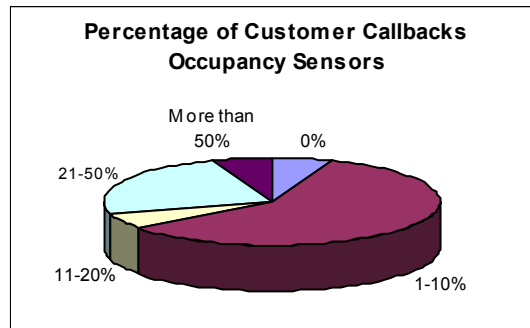


Figure 7: Percentage of installers who report frequency of customer callbacks for occupancy sensor installations.

The installers mostly charged by fixed contract for occupancy sensors, so many could not say what they charged for an individual control. However, one installer did charge a fixed price for a single control (\$20 to \$60) and another charged a unit price per room (\$150 to \$200).

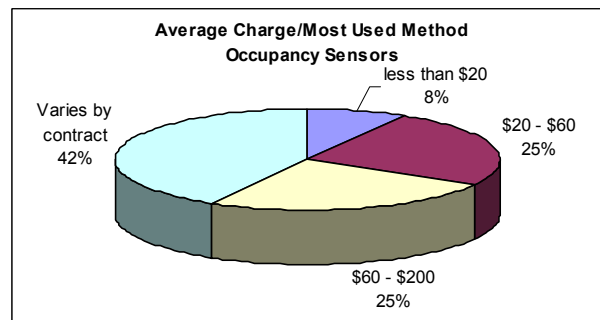


Figure 8: Percentage of installers who report range of average prices for their most frequently used method of charging for occupancy sensors.

Photosensors

(9 responses)

Very few installers work with photosensors; only nine returned or filled out this survey. Of those, two said that they did not install any photosensors last year. The most photosensors anyone installed was about 200.

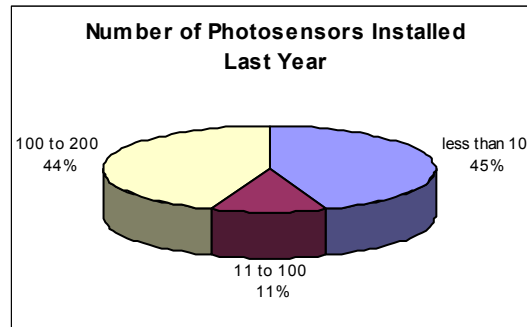


Figure 9: Percentage of installers who cite range of photosensors installed last year.

Unlike occupancy sensors, the installers do not see much additional market potential for photosensors. If no barriers existed, four installers (45%) felt they could put in fewer than 100 additional photosensors. Three installers, however, did think that they could put in between 100 and 1000 additional sensors.

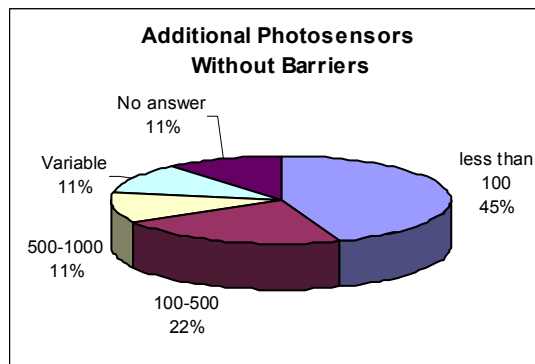


Figure 10: Percentage of installers who cite the range of additional photosensors they could install if no barriers existed.

The two reasons universally cited for resistance to photosensors were lack of customer demand and high hassle factor. However, installers were able install both ceiling- and wall-mounted sensors in less than an hour, and a majority (67%) were only called back to adjust photosensors 1 to 10% of the time. One of those who commented on this type of control said, “It is difficult to measure the exact savings, which is one reason we do not propose many of them.” But another commented, “Many simple applications are overlooked where photocontrols are a good fit; it’s easy to obtain a good payback. We can install sensors as a standalone project with no other change in technology.” Because these facts appear contradictory, it is difficult to ascertain the real reasons why photosensors are not more widely used; the sample is too small to draw any conclusions. Perhaps there are simply few installers who have experience with this type of control.

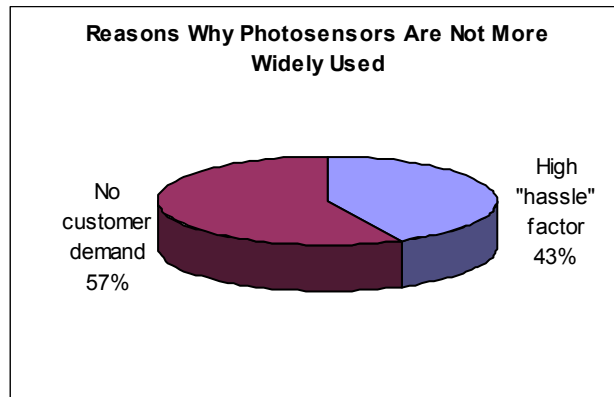


Figure 11: Percentage of installers who cite the importance of a reason for not using photosensors as “high.”

Building Automation Systems

(15 responses)

Most of the surveyed group install building automation systems. However, they are not using them to control the lighting. Controlling HVAC systems is by far the most common use of automation. More than 73% of installers say that automation systems control HVAC systems 76 to 100% of the time. In contrast, 53% of installers said that lighting is seldom controlled by building automation systems (only 0-25% of installations). Figure 12 shows how often installers cite each percentage range of installations for each type of building system.

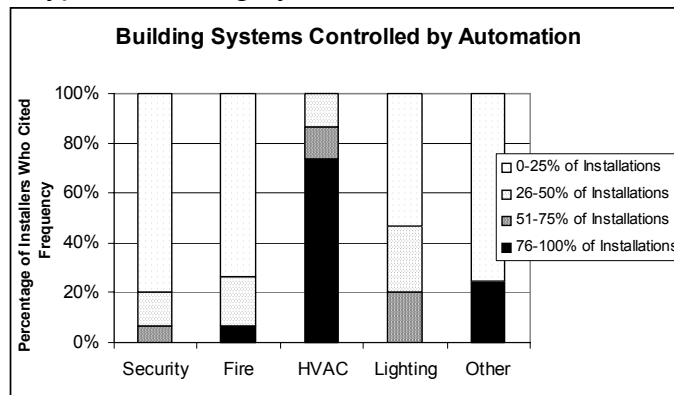


Figure 12: Percentage of installers who cite the frequency with which each building system is controlled by automation systems.

In most cases, the systems they install use twisted pair wire as the method of communication. Sixty percent of installers said they use this method in 76 to 100% of their systems. Very few installations use existing communication infrastructure as opposed to adding dedicated infrastructure for the automation system. Installers primarily use a proprietary protocol or LAN network with Ethernet as the communication protocol in these systems; 53% of installers use this method 76 to 100% of the time. BACnet or LonWorks, two other popular protocols were seldom

used; in both cases about two-thirds of the installers said they used these protocols in 0 to 25% of installations.

The installer is most frequently responsible for commissioning the automation system, 46% of the surveyed group said this was true for 76 to 100% of their installations. Responsibility for maintaining the system falls to the installer about 51 to 75% of the time, and to the building’s owner 26 to 50% of the time; about half of the installers gave these responses, as shown in Figures 13 and 14. Two installers said that the manufacturer, which in this case was the same as the installer, was responsible for maintaining the system in all their installations.

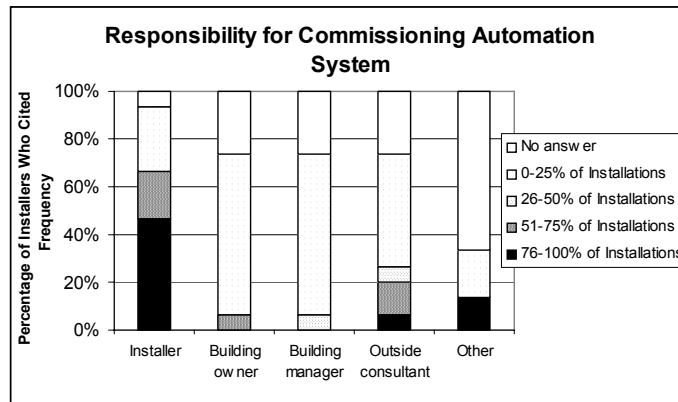


Figure 13: Percentage of installers who cite the frequency with which each category of responsibility commissions building automation systems.

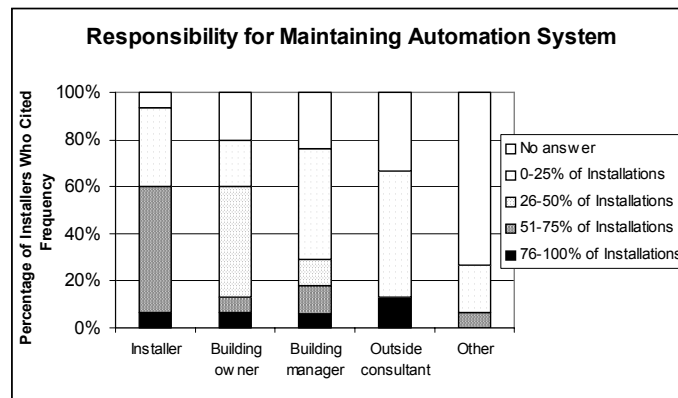


Figure 14: Percentage of installers who cite the frequency with which each category of responsibility maintains building automation systems.

Up to half of their customers ask for and make use of the data that they can obtain from their building automation systems, according to 53% of the surveyed group. This fact implies that building owners and managers might decide to increase the automation of lighting controls as they get used to seeing the benefits supported by the hard data.

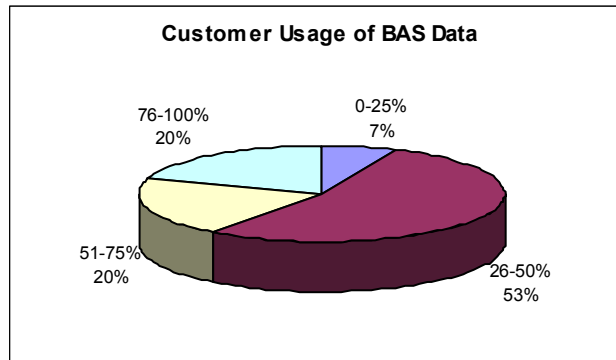


Figure 15: Percentage of installers who report range of customers who ask for and use the data they can obtain from building automation systems.

Again, lack of customer demand is the predominant reason why building automation systems are not more widely used, followed by high initial cost for the customer and low profitability for the installer. These reasons may go far to explain why such systems are seldom used to control lighting; the potential savings from controlling lighting are not enough to justify the investment. One installer commented, “System potential is underutilized.”

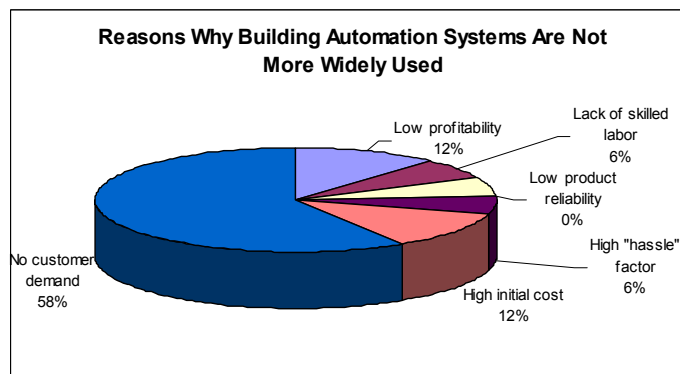


Figure 16: Percentage of installers who cite the importance of a reason for not using building automation systems as “high.”

However, 59% of the surveyed group perceive that customer demand for building automation systems is increasing, whether slowly or rapidly. Another third say that demand is holding steady. The results of this survey indicate that the future is promising for this type of system, but to maximize benefits for lighting loads, customers must be educated in the benefits of controlling their lighting with the systems.

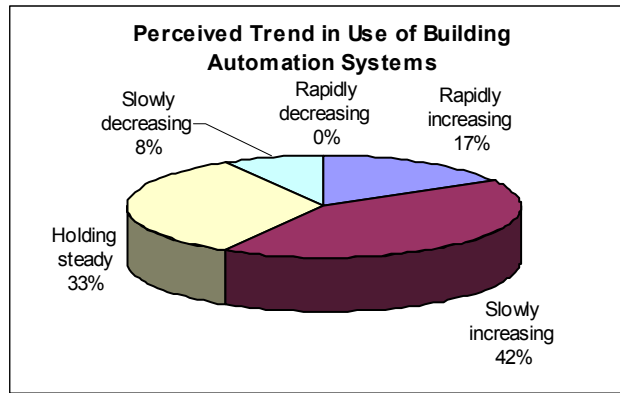


Figure 17: Percentage of installers who perceive trends in the use of building automation systems.