LED WATCH

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EASY TO INSTALL? WELL...

The complexity of installing connected lighting was on full display during product demos

There's a whole lot of learning taking place at The New School in New York City these days—and not just by the students. That's because the Next Generation Lighting Systems (NGLS) Competition has set up a "living lab" there, to learn as much as possible about connected LED lighting systems in order to facilitate improvements in the way they're designed, installed and used.

This past July, NGLS—which is co-sponsored by the U.S. Department of Energy, IES and the International Association of Lighting Designers—brought in seven connected lighting systems that are intended for interior applications and marketed as being easy to install and configure. Independent contractors for the installation were pre-screened to ensure that they had little or no experience with connected lighting systems, the goal being to find out just how easy the systems were to configure and install.

The installation and configuration process was observed by the NGLS organizers, and manufacturers were allowed to each have a representative present to observe work involving their systems, but they weren't allowed to help or interact with contractors during their work. The systems were installed in accessible working spaces, where they will remain in place for practical use and ongoing evaluation for a minimum of two years.

The participants were Cree (SmartCast control system), Crestron Electronics (Zum), LumenWerx (Magnum), Philips (SpaceWise DT), Nextek Power Systems (Nextek), RAB (Lightcloud) and Selux Corp. (Philips EasySense). Each system illuminates and controls its own space, providing manufacturers with the opportunity to observe and improve their products.

WHERE RUBBER MEETS ROAD

Although all of the systems were marketed as being easy to install and configure, more than half didn't measure up in either regard. Those "not easy" systems had more external components, which made them more complicated and likely to cause confusion. And because connected lighting is still so new, manufacturers are each taking their own approach. Depending on the manufacturer, three different methods were used to configure the systems submitted to NGLS: either a phone app, a handheld remote or remote Internet access. All of these methods had strengths and weaknesses, but many of the systems had issues with accessibility (e.g., the installer didn't have the right kind of cell phone) and ease of use, because the instructions were too complex or hadn't been updated to match the latest app.

Simple, clear, diagrammatic instructions make the difference. It was clear that if the installation looked like something the contractors knew how to do, they put the instructions aside and proceeded as usual. When referring to the instructions, they focused far more on the drawings and diagrams than on

Messy business: At The New School's "living lab," installation proved to be far from intuitive.

A BRAND-NEW COMPETITION

The Next Generation Luminaires (NGL) solid-state lighting (SSL) design competition has changed its focus from individual luminaires to *connected lighting systems*. Now known as the Next Generation Lighting Systems (NGLS) Competition, it's a very different animal from what it used to be. The changes were made to keep pace with the evolution of the lighting market—where, as SSL becomes increasingly mainstream, the cutting edge is now pointing toward whole systems rather than individual luminaires.

With an expanded evaluation process that involves installations in real-world settings, the indoor NGLS is well underway. It comprises four separate competitions, each of them involving a multiphase evaluation process that's spread out over a two-year period and includes installation, commissioning, control operation, lighting quality and user response. Manufacturers can submit entries in any single competition or in multiple competitions, matching the capabilities of their systems to the appropriate competition. NGLS will not select "winners"; rather, through this detailed, multiphase process it will recognize superior performance and identify areas for improvement.

The first indoor NGLS competition, which began in July, focuses on systems marketed as easy to install and configure. The second indoor competition, which opened in September, focuses on controls that are integrated into retrofit kits for recessed luminaires.

The first outdoor NGLS competition will focus on parking-lot connected lighting. It begins next year and will take place at Virginia Tech Transportation Institute and Virginia Tech Outdoor Living Lab.

For more information about the NGLS, visit *www.ngldc.org*.

detailed written descriptions. To increase the likelihood of the instructions being read, they should be put somewhere conspicuous, where the installer is sure to find them—such as in the box or on the plans—as opposed to requiring an additional step of downloading instruction manuals from a website.

What's more, some of the contractors reported having difficulty understanding the instructions, which underscores the importance of making sure they're written clearly, without unnecessary IT jargon and with good diagrams.

The performance evaluations took place in September and focused on both lighting and controls. Overall, most of the systems fell short of our expectations in a number of ways. One area of particular concern was the user interfaces. The NGLS evaluators were all seasoned lighting professionals, but they still had difficulty figuring out what the control system was doing, and how to get it to function as desired. Every manufacturer seemed to do things differently, with the result that we had trouble figuring out how to use the systems. The complexity of the systems also made them difficult to use. Sometimes the sensors simply didn't work, and sometimes the system wasn't programmed correctly to do what was asked. The consensus was that most of the systems were capable of performing well but just weren't set up right.

LONG-TERM AND BEYOND

These phases of the first indoor NGLS will be followed by long-term evaluations, which will focus on system performance, user satisfaction and reliability. In addition to the installation, configuration and performance, NGLS will evaluate the specification process, including design and performance parameters, with the goal of simplifying the specification of connected lighting systems. Findings will be published as each phase is completed and will include such elements as the time required and challenges faced in design, installation and configuration; the level of energy savings achieved; and user acceptance and satisfaction.

We'll be publishing the results of all NGLS studies on the NGLS website—success stories as well as challenges. But we also hope to be part of the solution, and for that we'd very much appreciate your input and involvement—for example, by letting us know what terminology should be used on performance specifications, so that the manufacturer can understand and in turn communicate to the installer. So stay tuned to *www.ngldc.org* to find out how you can be part of the process. To share your experiences with connected lighting systems, e-mail ngl@pnnl.gov.

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