

## Adding More Smarts To Smart Wireless Lighting

Apr 2, 2014 6:59 AM | Bruce Krulwich

Wireless Lighting. Smart lighting. These are phrases that are starting to reach market, at least among early adopters. To some it sounds like the obvious next thing. To others it sounds like techies making simple things complicated. It's certainly a new and growing trend, with several start-up companies and projects in the area, and some major electronics companies joining the fray.

"Wireless lighting" refers to systems in which individual bulbs can be controlled wirelessly. "Smart lighting" refers to systems in which individual bulbs can be controlled intelligently by a computerized control unit. In many systems the two are combined, with a computer controlling the light bulbs intelligently and wirelessly, and the terms are often used interchangeably.

Is smart wireless lighting the wave of the future, or a silly use of technology for no good purpose?

Looking at some of the start-ups in the area gives credence to the cynics. [One project](#), for example, promotes the ability to adjust the lights in your room from your smartphone or tablet, having lights dim or flash when you get notifications on your phone, and have a set of lights flicker to the beat of the music you're listening to. [Another project](#) uses smart lights to visualize data, changing color to reflect the weather forecast, the types of messages waiting for you, and so on. Are these really the goals and dreams that drive new technology? Will enough people want to have any of the above lighting features to enable a company to stay in business?

Bigger companies, however, are focusing on delivering real value with wireless lighting. For example, LG Innotek, a sister company of LG Electronics ([OTC:LGAEF](#)), is delivering [wireless lighting](#) in industrial settings, where site owners want to deploy lighting without having to run the electrical wires in the walls and ceilings. This benefit has made LG Innotek's wireless lights valuable to a number of big industrial customers. They also add motion sensors to their lights, enabling them to act as security or emergency lights.

LG Innotek is now taking their wireless lights to a new level. The company is exploring the use of ultra-wideband (UWB) radio chips from a start-up company called [DecaWave](#) in place of its current wireless network. UWB has several benefits, including low power usage, but its most game-changing benefit is its support for [indoor location positioning](#). DecaWave's DW1000 chips, currently under exploration by LG Innotek, can determine their own locations relative to the locations of other chips in the area. With UWB-equipped lighting installed, other UWB-equipped objects or tags in the area will be able to determine their locations very precisely.

As a practical benefit, lights that contain location-positioning chips can be put anywhere, and they will register their own locations in the controller system. This means that controlling the lights wirelessly doesn't require managing where each light bulb is placed, rather each light can position itself on a console's map. This is a big time-saver in a big industrial site.

Wireless location-tracking lights can comprise a location-tracking system, to track the locations of people, equipment, carts, and other industrial equipment as they move around the site. A big challenge in industrial location systems of this sort is to deploy the location-tracking infrastructure, and if this is included in the lights, this requirement is handled.

Other companies are also looking at adding location positioning to lighting systems. Philips ([PHG](#)), for example, is also [planning to add location to their personal wireless lighting systems](#). They are using [Visible Light Communications \(VLC\) technology](#) to transmit each light's location to camera-equipped devices nearby. This has an advantage of working on more devices, since the visible light communication can be picked up by smartphones and tablets with their built-in cameras, but it won't work when the lights are off, when power is off, in an emergency situation, and when there is smoke or other interference in the air.

In principle, visible light can in principle provide more precise distance and location measurements than most radio methods. When light is used in very short pulses, it can be used for high-bandwidth communication and can measure distances very precisely. But in practice, most visible light systems for indoor location can only handle signals from one light at a time. Such systems can determine their general location, usually right below the light whose signal they are receiving, and this is enough for a lot of applications. But such systems cannot do precise location positioning in the way that radio-based methods can, and certainly not achieve the 10cm accuracy that UWB-based methods can achieve.

Most importantly, the UWB wireless technology being explored by LG Innotek won't only be for location positioning, but will also support the wireless control that LG Innotek has been delivering. While it's transmitting information to turn lights on and off, the radio waves themselves will support highly-accurate location positioning. At the same time as industrial sites are selecting LG Innotek's lighting for the cost benefits of wireless control, they'll gain the ability to deliver location positioning.

So if you're working on deploying wireless lighting around your site, it makes sense to deploy lighting that supports location positioning. Not only will your console know where your lights are automatically, but you can also track locations of people and things moving around your site. These benefits might not be as fun as having lights flicker to the beat of your music, but it's a lot more tangible a benefit.