I try to devote most of the reviews I write here to the LEDs and other components which go into LED lighting products. But for every rule there's an exception, and in this case it's Cree's adjustable correlated color temperature (CCT) CR Series of wirelessly-controlled LED troffers. Although I have a few mixed feelings about its SmartCast wireless control technology, I'm posting this review because Cree's new Troffer is one of the first commodity-level products I've seen which makes a respectable attempt at realizing solid-state lighting technology's full potential instead of simply being a more efficient light bulb.

Fig.1 Cree's CR series troffers are now available with color-tunable LED arrays and networked wireless controls.

If you detect a note of frustration in the last statement, it's because most of today's LED products fall short of delivering the higher-quality, smarter lighting that the technology's capable of. For example, tunable color temperature has the potential to enhance both comfort and productivity, but nearly all the tunable products I've seen to date fall short. They are either too expensive for most applications, have color controls which are too clumsy for the average person to use effectively and, in many cases, both.

Until now, one of the only examples of what a practical color-tunable lighting product would look like was a technology demonstration at the Philips booth during Lightfair 2013 (click here to see it in action at Lightfair). At the time Philips said that the demonstration was not ready for commercialization and simply intended to show what might be possible in the future.

The similarities between the features of Philips demo unit and Cree's production troffers is remarkable and helps underline the progress they're making in turning this vision into a reality. This is the first of Cree's luminaires to feature instantly adjustable color temperatures, made possible by integrating its SmartCast wireless control and TrueWhite color tuning technologies. The
combination allows users to adjust the color temperature between 3000K and 5000K in 500K increments, enabling the use of only one troffer type in any space regardless of lighting preference.

![Cree's SmartCast handheld configuration tool and Philips' prototype dimmer/color temperature control](image)

**Fig.2: a) Cree's SmartCast handheld configuration tool b) Philips' prototype dimmer/color temperature control demonstrated at Lightfair 20123**

It should be noted that, at least for now, the color temperature of Cree's troffers cannot be adjusted from the current crop of SmartCast wall dimmers which everyday users will have access to. Instead, they must be set using a functional but less-elegant handheld configuration tool (Fig.2). I wish Cree was offering a wall control that was similar to the iPod-style control wheel which combined dimming and color temperature adjustment on the Philips demo system. But it's easy to connect the dots and see where Cree may be headed in the near future. But, even in its present incarnation, Cree's Smartcast system provides a color mixing solution that's as well-integrated and potentially very cost-effective. Cree's video (see below) does a good job of explaining how it simplifies installation as well as some of the other advantages it offers.

**Fig.3: Cree's SmartCast handheld configuration tool can be used to associate troffers into control groups and to adjust the color temperature of their output.**

On the other hand, I still have a few mixed feelings about the SmartCast wireless control system because it's a proprietary technology. It's still unclear whether Cree will license for use by other lighting manufacturers so being committed to a SmartCast system may also mean that you'll be locked in to purchasing Cree lighting products.

It does make use of open standards wherever possible, communicating in the 2.4GHz ISM band, using IEEE 801.15.4-compliant technology which uses readily available Zigbee compatible hardware but the SmartCast protocol isn't interoperable with standard Zigbee systems. Cree says it's had to go its own way in order to support many of the system's advanced features, such as OneButton™ Setup. This enables the fixtures and switches form their own secure wireless networks, perform daylight harvesting calibration, and form into groups to save energy.

Cree's decision to use a proprietary protocol is understandable in light of what it does. Nevertheless, I still hope they will consider licensing the SmartCast protocol to other manufacturers. While somewhat counter-intuitive, letting potential competitors use the protocol would could be a good business move. The larger ecosystem of manufacturers would encourage an even larger market for SmartCast-enabled products which deliver essential lighting controls without the extra design, installation and setup work needed by traditional lighting control systems.
I was unable to get any pricing information from Cree but they say that its improved troffers quickly repay their added purchase costs with energy savings of up to 70% (Compared to traditional fluorescent luminaires) as well as lower labor costs for specification, ordering and installation.

More information on Cree's CR series Troughers is available at http://www.cree.com/Lighting/Products/Indoor/Troffers/CR-Series

A video which explains Cree’s SmartCast wireless lighting control system may be viewed at https://www.youtube.com/watch?v=xl2L-dbgn54