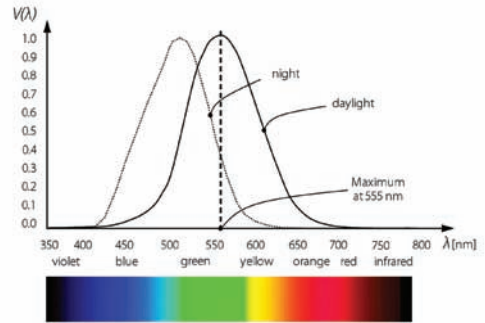




6 Let there be light

Physical fundamentals of light and lighting

The importance of light, both for the human eye as well as for a camera, is often underestimated. When dealing with lighting techniques, it's important to bear in mind that one does not directly perceive the topology and texture of an object, but its effect on incident light.



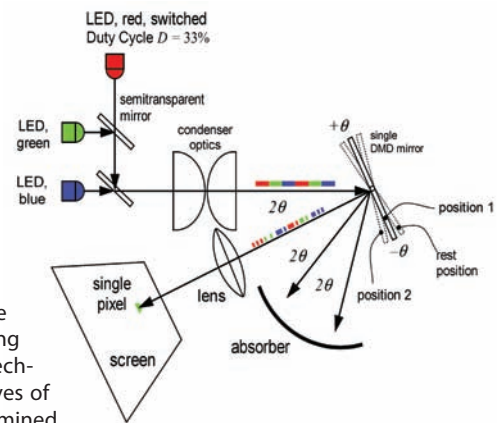
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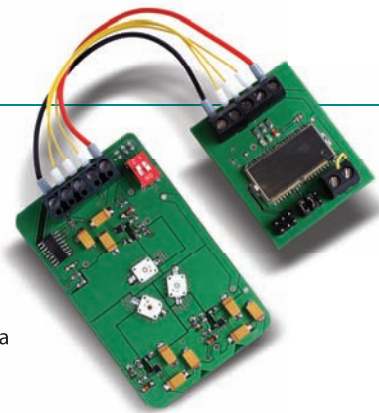
In this Elektor special issue, several articles have already demonstrated the advance of LED technology. So far, breakthroughs in the pinnacle of projection technology have been excluded. The following article investigates the current state-of-the-art in LED projection technology and explains the operation of one of the first representatives of this family, the Toshiba FF1. Advantages and disadvantages are examined, after which, as an interesting application of this technology, industrial 3-D data acquisition is presented.



29 Ambilight with Bluetooth

A modular power RGB LED system with PC interface

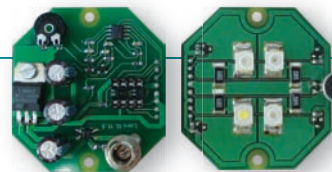
The Philips LivingColors lamp is enjoying increasing popularity in bringing mood or "ambience" to the home. This self-made "Ambilight" has a Bluetooth interface, making it possible to control the lamp using simple AT commands from, for example, a PC or a mobile phone. Using direct generation of colour values and lighting profiles with transitions, the circuit is capable of producing a true ambience.



46 Universal LED lamp

With programmable colour change

Soft lighting with running colour change sequences, which one is almost tired of seeing, are available on any street corner. With such technical complexity, it's actually a pity that we can't modify their sequences. A standard programmable LED lamp unit would be nice. Here are suitable instructions.

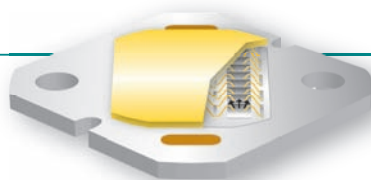




50 Spotlight

Driver electronics and heat management for LED-based lighting

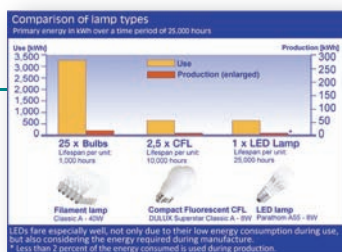
Modern LED-based lighting, also known as Solid-State Lighting (SSL), scores well against all previous technologies through its combination of reliability, quality and efficiency. When designing solid-state lighting, however, one needs to overcome certain technical challenges in the areas of heat management, driver electronics and optics. With a reference design based on an electronic driver board from National Semiconductor and a SynJet cooling module from Nuventix, one has a complete solution for both driver electronics and heat management for LED-based lighting.



58 LEDs for a new era in lighting

Light-emitting diodes and their possibilities – from a manufacturer's point of view

With the phasing out of light bulbs, which began in September 2009, a part of industry history that has lasted 120 years came to an end. The farewell wasn't easy – the hoarding of filament light bulbs was an indication of the consumers' insecurity. However, above all, LEDs stand ready in the starting blocks, as energy saving, environmentally-friendly, long-lived, compact and, ultimately, economical sources of light, to enable a complete new generation of lamps. With a lifespan of more than 40,000 hours and a light output of up to 105 lumens per watt, the new Sharp LEDs, in terms of efficiency and light output, are among the leading lamps on the market. For a soft landing in a new age, the so-called retrofit LED lamps with standard sockets can easily replace conventional lighting.



63 LED life-cycle assessment

Results of a life-cycle study on LED lamps

An LED life-cycle assessment, conducted by Osram, has shown that the newest generation of light sources already earns a high grade in terms of environmental-friendliness. In the study, the entire life cycle came under the magnifying glass - how much energy and raw materials are used during their manufacture, their use and their disposal, and what the ecological impact is. The result: Current LED lighting matches the environmental grade of compact fluorescents, and is far superior to that of conventional light bulbs.

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