Display Evaluations Get Support From Seric's Solar-Like Lamps

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Gauging the characteristics of displays poses some interesting challenges for manufacturers. Besides the fact that many operating conditions affect display quality, manufacturers also have to figure out how to approximate the many different settings in which their displays eventually will serve.

Digital consumer electronics are undergoing remarkable advances in technology and performance, form, features and functions. Their progress has attracted strong notice in recent years. With the start of digital terrestrial broadcasts, new trends have taken hold, and sales have expanded rapidly for LCD and plasma display panel (PDP) TVs, as well as other flat-panel systems. Although Japan holds the lead in the production of fine-quality display panels, manufacturers in Korea and Taiwan are giving their Japanese counterparts some pretty stiff competition.

Now the factories in China show every sign of gearing up to become noteworthy contenders, too. As a result, price competition has become increasingly fierce. The entry of new display technologies including organic light-emitting diode (OLED) panels and field-emission displays (FEDs) is likely to provoke additional turbulence in this already competitive market.

Amid these trends, manufacturers consider it essential to achieve additional drops in the cost and power consumption of their panels, while also raising the image quality. Success in these areas will require careful evaluation of panel characteristics and performance.

A model from the 100W series of Solax lamps

A model in the 500W series of Solax lamps

Seric Ltd. manufactures and sells the Solax line of lamps. The company calls these "artificial solar illumination lamps," because they emit light that is extremely close to natural sunlight. The Solax lamps play an important role in the evaluation of flat-panel displays.

Light and Its Uses

Solax lamps emit light that is almost the same as direct sunlight in midsummer. They achieve an average color-rendering index of 98. The light source has a color temperature of about 5,500K. Light direct-current light, the light from Solax lamps is flicker-free. The light exhibits nominal changes in characteristics over time. Additionally, the spectral distribution does not contain a strong brightline spectrum.

To make the most of these characteristics, Seric has put Solax lamps to work in diverse fields involving color, including color inspection of automobile paint, color inspection of color printing output, and color inspection of cosmetics. Recently many manufacturers of digital cameras have begun to use Solax lamps as standard light sources in studio lighting during the development of digital cameras.

Meanwhile, there has been growing demand for special, artificial solar equipment to serve as an alternative source of solar light energy. Areas requiring this kind of equipment include performance evaluation of solar batteries, and testing equipment for light resistance.

Seric offers two kinds of Solax lamps, the 100W series and the 500W series. By varying the optical filter and the reflection mirror, the company can adapt the lamps to specific purposes. For instance, users can select an optical filter that includes or excludes ultraviolet rays, or infrared rays. In this way, it is possible to obtain a light source whose wavelength characteristics correspond to different test purposes.

Outdoor Displays

Different kinds, and especially different sizes of flat-panel displays generally operate in different settings and environments. Small and medium-sized displays generally serve in portable displays, which often must work out of doors. Flat-panel displays larger than about 30

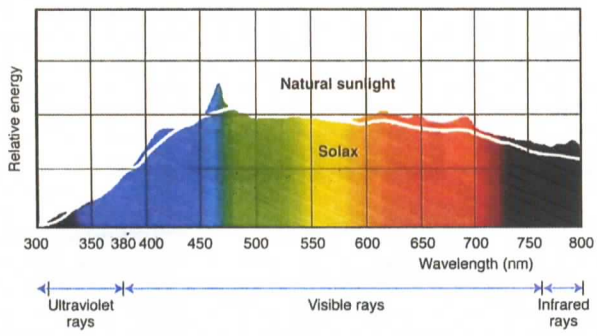

Fig. 1: Comparison of spectra for Solax lamps and natural sunlight

inches are common as the viewing screens in TVs and other indoor-use equipment.

Manufacturers evaluating small panels can work with the Solax XC-100ASS or the XC-500AFSS. These lamps cast an illumination as bright as direct sunlight, about 100,000 lux, enabling technicians to gauge the appearance of the colors the panel displays under direct sunlight. The same two lamps are suitable for evaluating small panels that work indoors as well. Furthermore, the 100,000-lux artificial sunlight from the XC-500AFSS supports evaluation of the color reproduction of medium-sized panels.

Another test evaluates how the display exhibits colors under light-scattering conditions. For this purpose, technicians can cast light from multiple Solax XC-500AF lamps onto the ceiling of the test room. The use of more than one lamp creates a light source equivalent to a skylight.

A third test checks whether exposure to ultraviolet rays has impaired the image quality. For this test, engineers can use a 2.5kW solar illumination system whose light emissions contain the same amount of ultraviolet rays as direct sunlight. The illumination system will cast the light onto the medium-sized flat panel, with only small variations across the entire surface.

Technicians conducting evaluations of large flat-panel displays work in test rooms whose lighting systems imitate the conditions of the average living room. Multiple kinds of fluorescent lamps join a halogen lamp on the ceiling. The addition of artificial sunlight from a Solax lamp allows recreation of environments where sunlight shines into a room through a window. The structure of the window permits the installation of a color-temperature conversion filter for replication of western sunlight, or sunshine coming through a northern skylight.

In test rooms like these, engineers can evaluate the image quality of flat-panel displays under a variety of lighting environments. They also can compare their own panels with those from other manufacturers, and can conduct sensor evaluations that gauge whether the panel is easy to see and to view.

Multiple Settings

Flat-panel displays must work in a variety of environments and lighting conditions. Accordingly, the scale of test facilities must vary, too. Besides operating in different environments, displays in handheld equipment also must be visible from different angles. Therefore, tests of these displays must take diversity and reproducibility into account.

For all flat-panel displays, large and small, it remains quite important to lower the power consumption. In mobile phones, the display runs on battery power. Therefore, lowering the power consumption will help extend the device's operating time. One approach to cutting power usage has been to decrease the backlight brightness. However, this makes it difficult to see the screen in bright sunlight. Balancing power consumption and sufficient brightness therefore has been a challenge for manufacturers.

Among manufacturers of large flat-panel displays, especially PDPs, cutting power consumption is particularly important, because this will improve the competitive abilities of plasma displays against LCDs. However, the display of news, variety shows and other TV programs that make heavy use of bright images tends to raise the power consumption. Again, the backlight holds the key to lowering power consumption. As manufacturers pursue the optimum balance between backlight brightness and power use, they will rely increasingly on sensory tests that show how images look in various kinds of light.

Conclusion

Solax lamps, with their ability to cast artificial solar-like illumination, can make a contribution to the steady progress in flat-panel displays. From now on, Seric will involve itself in the efforts to ensure color compatibility between the images as they appear on a display screen and the actual colors of the original objects. The company aims to support the development of flat-panel displays that can faithfully reproduce the appearance of works of art, images of natural scenery, and photographs of professionally prepared foods. Ultimately, it may even become possible to provide colors that surpass those of the original objects in vividness and richness.

About This Article

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