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Big (City) Lights



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The archive label "06.2019" refers to June; the actual article footer identifies issue 3/2019. Historical electrical specifications, aperture / sharpness wording, a rated current 300% higher and five-year warranty are translated as printed. Original publisher artwork, logos and advertisements are retained in their original language.



Fig. 1: Homogeneous light from a 1,500 × 1,500 mm LED light enables precise inspection of adhesive application on an automotive parcel shelf, with reliable detection at 0.3 mm resolution.

Big (City) Lights

Intelligent LED area lighting for large test objects

AUTHORS: ALEXANDER TREBING, MANAGING DIRECTOR, CRETEC GMBH; KAMILLO WEISS, TECHNICAL JOURNALIST | IMAGES: CRETEC GMBH

Large test objects require more extensive knowledge of lighting technology. With small test parts, covers or high light intensity make it much easier to prevent external interference. With large parts, conventional approaches require considerable effort.

For fully automated, flexible vision systems handling large test parts, Cretec offers a specialised range of intelligent, large-area, modular lighting systems. Backlights extending to the edges or front lights enable efficient solutions even for complex requirements. As in professional photography, Cretec bases illumination on the definition of luminance, which describes the brightness of light emitted by surfaces and precisely defines homogeneous emission across the entire illuminated area. This is important for difficult measurement

objects whose shapes and reflective properties impose special demands, for example rapidly moving objects in production lines requiring intense illumination without overexposing the centre. Maximum homogeneity right to the edges is also essential for consistent application results.

The available lighting sizes provide illuminated areas from 50 × 50 mm to 6,000 × 6,000 mm.

All light colours are available in continuous or strobe mode. The LED boards are developed in-house and fitted with white, red, green, blue, infrared, ultraviolet, RGB or RGBW LEDs.

In the backlighting module, the spacing between the dimmable LEDs and their distance from the cover - a special diffuser - are selected to create an optimised, homogeneous illuminated field extending to the edges. Openings for optics can be incorporated into the lights, allowing a camera behind the light to look through it. The lights are factory-adjusted and need no further manual adjustment when the application changes.

In practice, for example, a custom blue light measuring 1,500 × 1,500 mm and 45 mm high has the following technical specifications: 24 V DC supply, 60 A current, 1,440 W power input, 470 nm LED wavelength (blue), 12,480 LEDs, power supply and external control via several waterproof M8 connectors. This provides approximately 32,000 lm luminous flux. The light and connectors have at least IP65 protection, optionally IP67; a hygienic design is also possible.

Individual adjustments

For each application, users have a wide range of individual adjustments available through external control. Four-colour LEDs enable several successive colour exposures of a product, allowing precise detection of complex features with just one camera. All settings for different product variants are stored in the vision software as ready-to-use recipes. White light with controllable colour temperature also enables hyperspectral imaging.

Operating LEDs in strobe mode offers advantages for demanding tasks. Synchronised in the

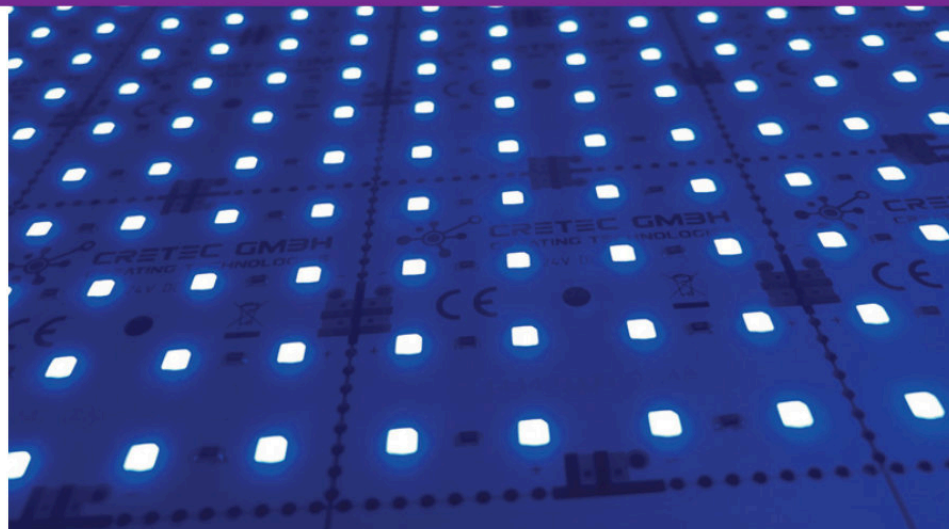


Fig. 2: The spacing between the dimmable LEDs is chosen to ensure an optimised, homogeneous illuminated field.

microsecond range, the test objects are captured with high image sharpness. Compared with continuous light at larger aperture values, potentially accompanied by image noise, strobe light can use smaller aperture values with greater sharpness. The very short flash duration permits operation at a rated current 300% higher and thus considerably greater illuminance. External influences such as ambient light are also largely eliminated. Changes in LED light intensity over the service life or with temperature can be considered and compensated by the control system. The lighting modules have a five-year warranty.

Perfect adhesive bonding

The automotive industry increasingly requires larger components to be automatically checked for potential defects using machine vision. For example, adhesive application on automotive components must be inspected fully automatically to ensure precise assembly. This complex task was solved using a blue LED module measuring 1,500 × 1,500 mm with a centrally installed 25 MP camera, providing excellent illumination homogeneity. Robots precisely position the adhesive-coated parcel shelves in the camera's field of view. The system then precisely

detects, at 0.3 mm resolution, whether adhesive has been applied evenly across the entire component.

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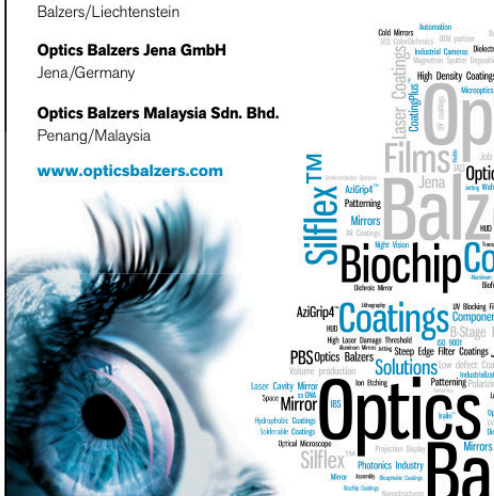
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