Keeping the lights on

BY MIKE ARIENI, MANAGING DIRECTOR, SOLAR BOLLARD LIGHTING

The use of adaptive lighting is becoming common due to advances in technology and increased focus on minimising energy consumption. Adaptive lighting features include changing illumination from a higher, compliant lighting category in peak times to a lower category during off-peak times, or turning the lights off due to curfew restrictions.

According to AS/NZS 1158.3.1:2020 Lighting for roads and public spaces – Pedestrian area (category P) lighting Section 3, Subcategory 3.1.1, there are compliance requirements for adaptive lighting.

'When adaptive lighting is used, each dimming level shall be such that it complies with all the requirements of a relevant lighting category. The control system shall be fail-safe in that on a failure of any element of the control system, the luminaires shall revert to their initial undimmed level.'

Motion sensing is another form of adaptive lighting commonly used in solar lighting. Typically, solar lights with a motion sensor run in a dim mode and increase to a bright mode for a brief period when motion is sensed. This drastically reduces energy consumption, battery size and product cost.

An issue with motion sensing is accurately estimating the amount of time the solar light is in bright mode. If pedestrian traffic is higher, or continues for longer periods than originally anticipated, the battery may quickly be depleted, and the light will stay dim or turn off.

Two common issues with such solar lighting products are:

- the dim mode is too low to provide compliant lighting
- light output in both bright mode and dim mode reduces as the battery level is depleted. Completing a lighting design in either mode then assumes that the battery is always fully charged.

For these reasons, solar lighting providers must demonstrate that the dim mode setting provides minimum permissible compliant lighting, regardless of battery level. If they do not, customers may be exposed to liability risks.

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AS/NZS 1158.3.1:2020 Section 3, Subcategory 3.1.1, states that each dimmed mode complies to the minimum illuminance value requirement of the applicable lighting subcategories. This reflects the passive infrared sensors' or motion sensors' reliability, and can be affected by many factors, including:

- distance, direction, rate of movement, ambient temperature, and size of person
- can be triggered by stray pets, birds, insects attracted to light, passing vehicles, or tree branches swaying in the wind
- failure to illuminate to compliant lighting levels due to various causes, such as vandalism
- no fail-safe design.

Quality commercial solar lights have no requirement for sensors or dimming for battery conservation. Their power systems are custom designed to suit the installation location during the winter solstice, when nights are the longest and the least amount of daylight is available.

This ensures a compliant illumination outcome year-round that is fit for purpose, with a long life cycle. ●