



Feel comfortable in your building

# Our solution for Zoo Antwerpen





## The Monkey House: Brilliantly lit – Antwerp Zoo (BE)

*Antwerp Zoo is Belgium's oldest zoo. Located in the centre of Antwerp, it serves as a green oasis in the city. Over 5,000 animals live on the zoo's grounds. The small primate house, with its 18 enclosures, is home to various species such as spider monkeys, mandrills and owl-faced monkeys. With the modernisation of the house, Antwerp Zoo is now relying on Human Centric Lighting and the automatic lighting control system from B.E.G. Brück Electronic GmbH*

### Well-being indoors

The importance of light for us humans has been researched in greater detail in recent years. It was only in 2002 that researchers discovered photoreceptors on the retina of our eyes that are not responsible for vision. Rather, these special ganglion cells register the brightness of the surroundings and, when light enters, regulate biological processes in the body such as the pupillary reflex or hormone production.

We experience just how much light enhances our well-being at the start of every spring: as the days grow lighter again, we feel more active, are in a better mood and are usually more focused than during the dark winter months. Light synchronises, among other things, the 'internal clock' – a complex control system that coordinates and synchronises all bodily functions in a 24-hour rhythm. Too little light during the day can cause the internal clock to shift or make sleep and wake phases less distinct. Both have a negative effect on the circadian rhythm and can affect health. Indoors, light colour and intensity can be optimised using HCL.



*Optimised lighting for the monkeys at Antwerp Zoo.*

### Human Centric Lighting becomes Monkey Centric Lighting

Human Centric Lighting, or HCL for short, is the name given to the technology that places the well-being of room occupants at the centre of attention. Biologically effective lighting is tailored to the user's circadian rhythm. It must effectively support natural periods of activity and rest throughout the day. In addition to humans, animals and plants can also benefit from biologically effective lighting. In agriculture, light is already being used in this way. Because it is monkeys at Antwerp Zoo that are enjoying the benefits of HCL, this extraordinary and beautiful project at B.E.G. is being run 'in a species-appropriate manner' under the name 'Monkey Centric Lighting'.

The Belgian zoo's requirement was that the lighting should be tailored to the animals' daily routine. In addition to the brightness of the artificial light, natural daylight was also to be taken into account: this results in efficient energy savings. B.E.G.'s presence detectors now carry out regular light measurements in the small monkey house and control the artificial lighting accordingly to achieve the desired brightness.

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*Systems used: DALI*

*Products used\*:*

*2 x PD4N-DALI-SYS + SM-Base*

*3 x PBM-DALI-SYS-4W*

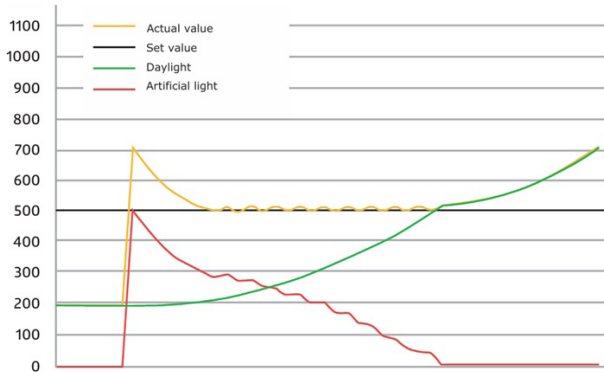
*2 x PS-DALI-SYS-USB-REG*

*1 x ROUTER-DALI-SYS-REG*

*1 x VPN Remote Hardware*

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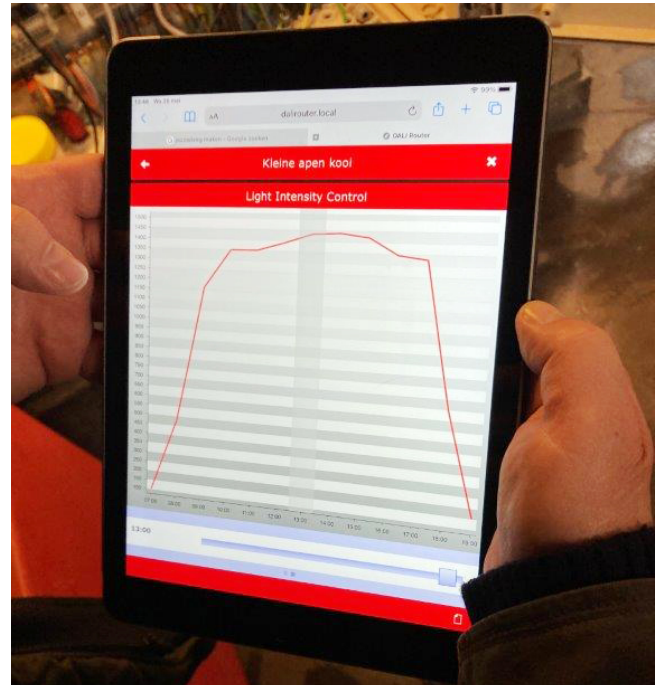
## How Monkey Centric Lighting works in Antwerp



*Daylight-dependent control in the monkey house*

The colour temperature of the new luminaire, 3000 Kelvin, should not be altered. 3000 Kelvin corresponds to a bright, warm white light, which is perceived as very cosy. At the same time, the lighting is bright enough to allow visitors a clear view of the enclosure. The desired day-night cycle is thus achieved solely through the appropriate brightness levels. B.E.G. always handles the individual planning and implementation in close consultation with the designers and building owners.

The functions required by the zoo were implemented using the B.E.G. DALI-SYS lighting control system. DALI-SYS is a modular, networkable and scalable lighting management system. Distributed intelligence ensures a high level of operational reliability. A wide range of functions, such as Guided Light and HCL, are integrated into DALI-SYS. As a rule, DALI-SYS allows users to select a pre-set light curve – for example, for offices, schools or industrial settings – or to design their own light curves. Various tests carried out in the small primate house helped the B.E.G. system integrator to implement a light curve that is optimal for the animal inhabitants.



*Simulated daylight curve using DALI-SYS*

To implement Monkey Centric Lighting, twilight is simulated in the morning between 7 and 9 am and in the evening between 5 and 7 pm. It is brightest at midday, with a maximum of 1450 lux. Using a timer and a DALI-SYS push-button module, the lights were switched on at 6.45 am and switched off at 7.15 pm. The lock function was used for this purpose. At 7.15 pm, the DALI-SYS multisensor (presence detector in the DALI-SYS) receives a 'Lock' signal via the push-button module. The detector is locked, the sensor's automatic function is deactivated, and at the same time a final command is sent to the DALI luminaires. In our case, the lighting is dimmed to 0%. Early in the morning at 06:45, an 'Unlock' signal is sent, which reactivates the automatic function.

The lights in the monkey house were mounted between the bars and the skylights, and the multisensors were installed one on the left and one on the right side of the enclosure. No direct sunlight enters here that could distort the light readings.

## Implementation



*The system equipment, such as routers, power supplies, etc., has been reinstalled in the control cabinet.*

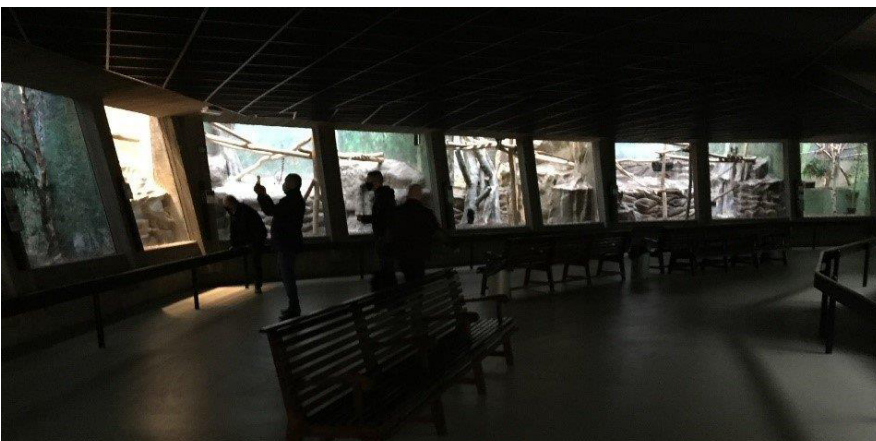
The multi-sensors were used purely as daylight sensors for light measurement. In addition, two further push-button modules (one for the left side of the enclosure and one for the right) were installed to switch the light on or off manually if required. The DALI-SYS push-button modules can be used with standard switch ranges.

A compelling before-and-after comparison The before-and-after comparison is compelling. Thanks to the modernisation work, the lighting in the enclosures appears much more natural and the visitor area is significantly brighter. This has created optimal lighting conditions for both the animals and zoo visitors.

## Before – the monkey house without HCL



## Afterwards – improved lighting conditions with HCL from B.E.G.



The following components were installed in the small monkey enclosure:

2x



93340 PD4N-DALI-SYS

+



93307 SM Base

3x



92842 PBM-DALI-SYS-4W

2x



92843 PS-DALI-SYS-USB-REG

1x



93480 ROUTER-DALI-SYS-REG

1x





99122 VPN Remote Hardware




## Personal advice

Our team is always on hand to offer advice and assistance. If you have any questions about your order or our products, please give us a call or send us an email.

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