

Light is the solution  
ENCELIUM™ adds more  
to your light

Light is OSRAM





# Welcome to the next-generation lighting solution

## The ENCELIUM™ Light Management System

As the lighting market continually reinvents itself, light management systems are becoming more and more important. To meet this challenge, you need one thing above all: an expert partner. OSRAM fits the bill with over 100 years of experience in the lighting market and with particular expertise in innovative light management for comprehensive control of buildings.

Working together with OSRAM, you receive dedicated personal support to assist you with whatever you need and to help you plan and install a light management system tailored to your requirements. To do so, OSRAM has a wide variety of products for all applications and thus can offer customised lighting solutions from a single source.

The highlight of our light management range is ENCELIUM™, a DALI-based system that enables complete lighting control for buildings, can be set individually to meet your needs and has many advantages: more flexibility, more control and more energy savings are the main ones. But there is even more to it than that: while the lighting market is constantly changing, ENCELIUM™ is leading the way into an innovative, cutting-edge future.



# Trends

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# ENCELIUM™

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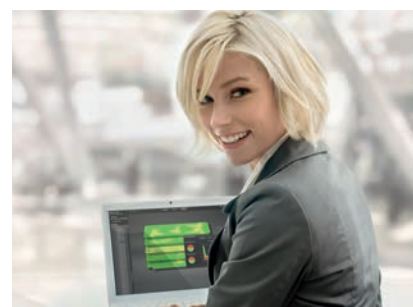
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# Facing the future with innovation

Trends in the lighting industry



## Digital standards

Now it's time for lighting to push energy savings even further. In the not-so-distant future, building owners who manage to drastically trim energy usage by implementing advanced lighting control schemes will inevitably have an edge when it comes to cost savings, sustainability, and possibly even compliance with certain codes and standards.

Today's lighting equipment increasingly has network communications capabilities. Having a complete DALI system means having a system with sensors, ballasts and inputs

that speak the same language being connected on a simple two-wire bus circuit. All DALI components use an industry-standard protocol, meaning they can easily be combined – a basic requirement for any lighting installation.

All you need to embrace these trends in lighting is ENCELUM™. The integrated light management system not only helps you keep up with the continually changing needs in the world of lighting, it also provides a variety of possibilities for every area of application.

### Solid-state lighting

Another trend clearly visible in the lighting industry is the transition towards solid-state lighting – or, in other words, LED. Luminaires with LED technology are becoming increasingly important and are already in use today in nearly all applications.

Most LEDs can not just be switched on and off, but are also dimmable and controllable and therefore enable lighting control for applications where non-dimmable light sources have been required up to now. Furthermore, they create new lighting applications thanks to their versatility and compact size. In this sense, lighting controls and the transition to LED are two new trends that complement and enhance each other, delivering the maximum value to customers and end users.

### LEED and BREEAM

Particularly when it comes to energy efficient thinking, the construction industry plays a key role in global climate change. As lighting usually represents a large proportion of a commercial building's energy consumption, it is imperative to reduce overall energy usage, and thus to avoid inefficient expenditures on lighting.

Technology-based lighting control is a major focus topic industry-wide, particularly in the accreditation of new buildings and assigning new and renovated buildings a rating determined by how sustainable they are. This system originated in the early nineties from the UK accreditation system BREEAM.

With LEED, Leadership in Energy and Environmental Design, another system was set up in the US in 1995. Both have helped introduce stronger regulations for new buildings in terms of energy savings and CO<sub>2</sub> emissions.





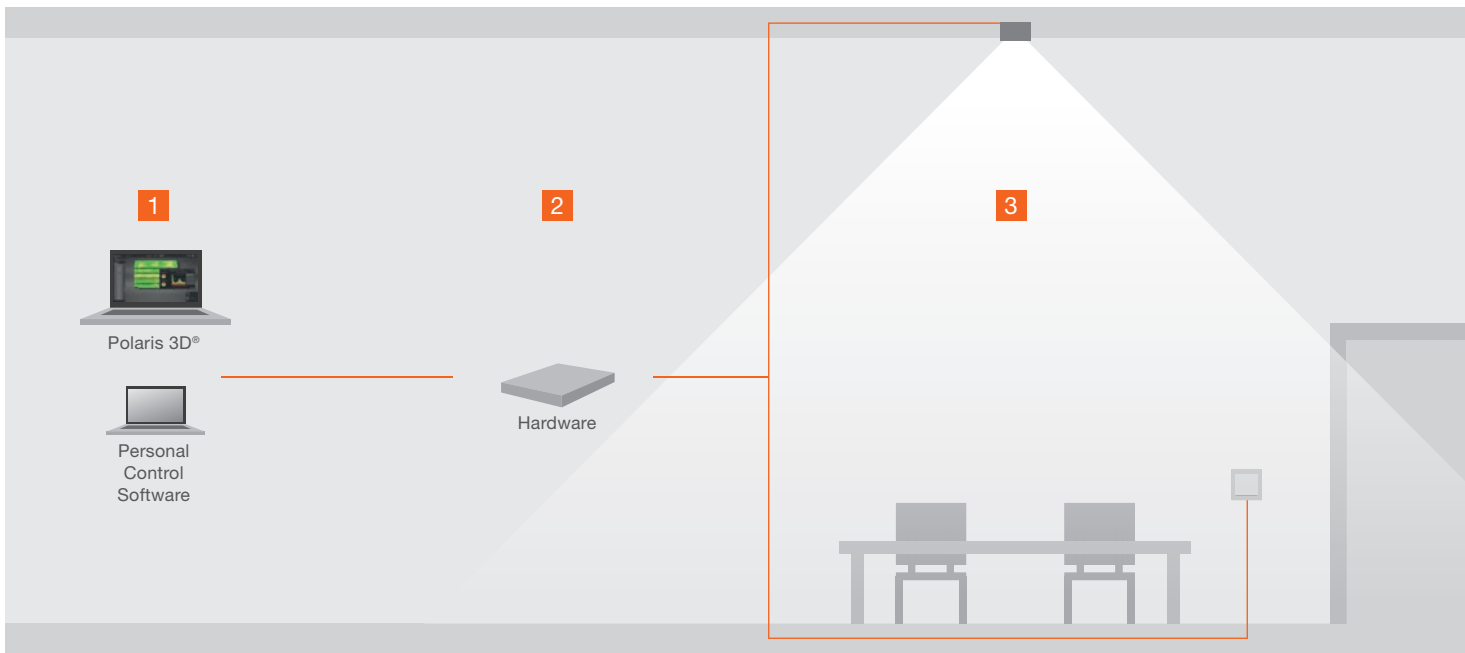
# ENCELIUM™ – adds more to your light

More flexibility, more control, more energy savings

Lighting scenarios change every day. What you need is a flexible lighting solution which adapts to these conditions. OSRAM presents ENCELIUM™, an integrated DALI based system for entire building lighting control that allows energy savings in the most convenient and highly versatile way. Thanks to the scalability of the system architecture, it works with any building size and is easy to integrate into existing building management systems.

ENCELIUM™ technology has already proven its value: it has been impressing customers around the world for the last ten years and has demonstrated excellent reliability both when retrofitted and when used in new construction projects – from 15,000 to 40 million square feet in size.





### Two essentials for lighting control – software and hardware

The success of the light management system is mainly due to two things: hardware and software. While it is DALI based and uses standard lighting control components, the core element of the system is the innovative Polaris 3D™ software, which provides comprehensive control of the whole lighting system from anywhere via remote access. And with six energy management strategies, it is even possible to increase energy savings by up to 75 % (for further information see page 17).

As you can see, with ENCELIUM™, changing and enhancing your lighting has never been so easy. More information about the hardware and Polaris 3D™ can be found on the following pages.

#### 1. Polaris 3D™ software

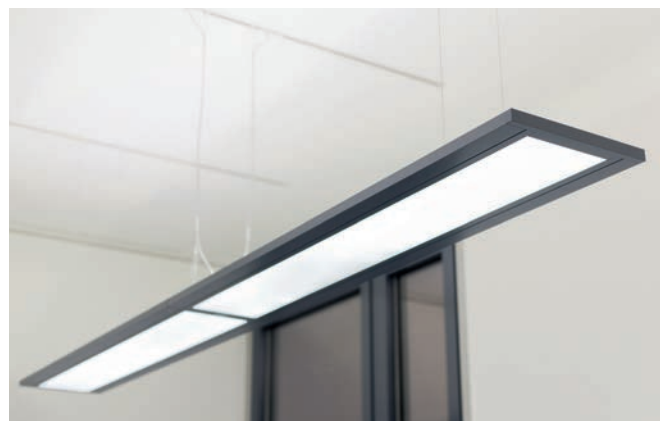
The Polaris 3D™ software is the core element of the ENCELIUM™ system. It facilitates the commissioning, usage and data analysis of the lighting installation. The 3D colour gradient visualisation shows how efficient your installation is and immediately reports the savings achieved.

#### 2. ENCELIUM™ hardware

Networked system devices process and translate the control commands and define the rules to manage the inputs and outputs in the installation. By using the standard network rules, the system can be enhanced and scaled to be suitable for any application or building size.

#### 3. Field elements

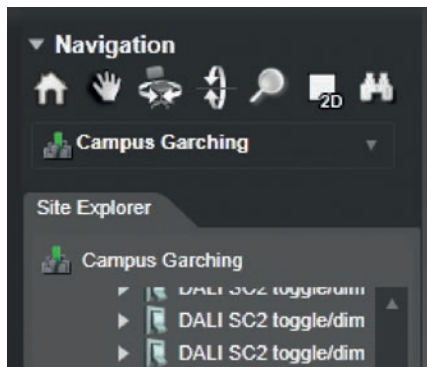
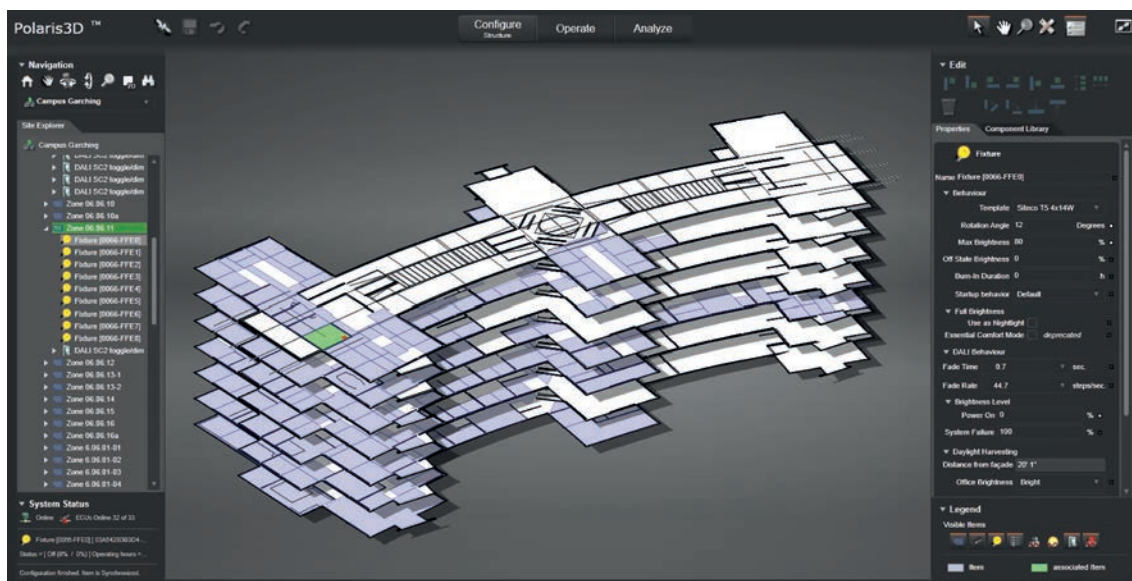
The field elements in the ENCELIUM™ system allow individual control and monitoring of each single luminaire, sensor and light switch. The components are available as independent units, flush or luminaire-mounted, and react to instructions sent by the ECUs.



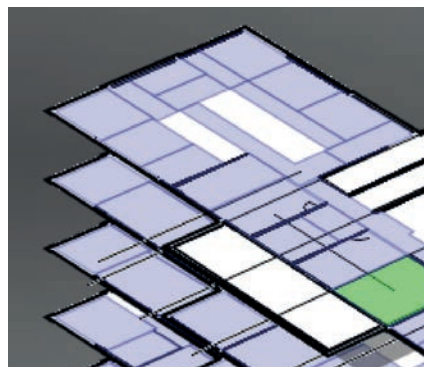
# Lighting control of entire buildings at your fingertips

With the Polaris 3D™ software and easy-to-integrate hardware

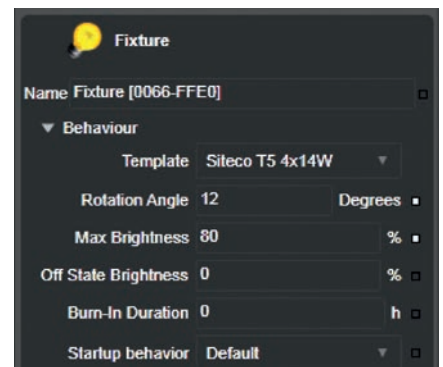
You can survey, check and verify the lighting in your building – or several of them – in 3D with Polaris 3D™. Zooming, panning or tilting the view at the touch of a button helps you to optimise the lighting performance of your building.



**Well-structured:** Site navigation with a tree view listing all components related to the zone structure



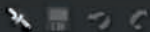
**Outstanding:** Polaris 3D™ offers a three-dimensional graphical overview of the whole site



**Personalised:** Great flexibility and customisation due to highly detailed function windows



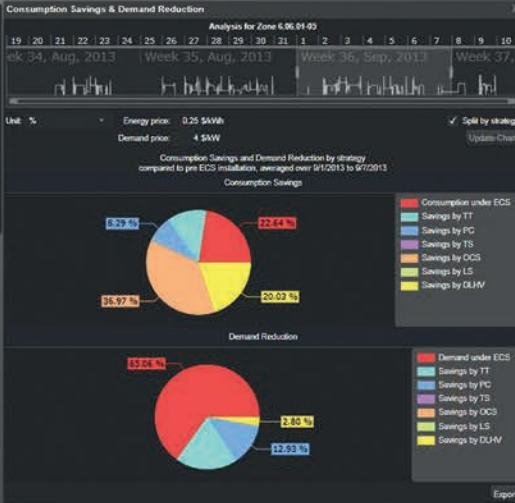
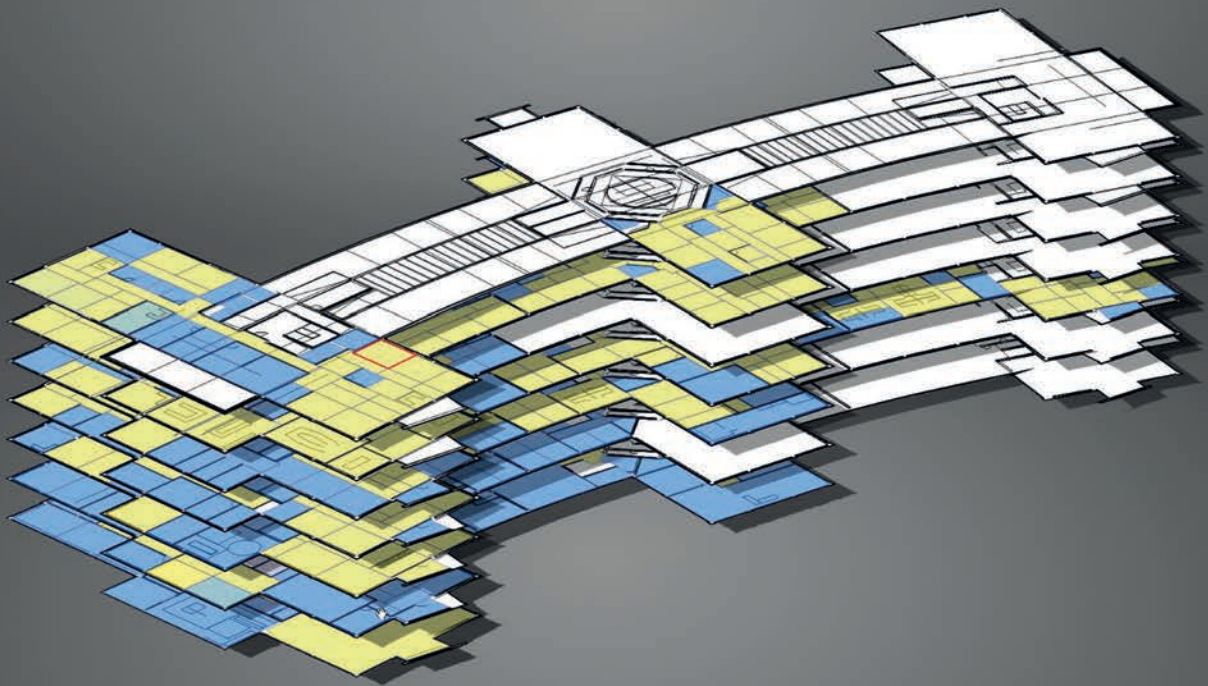
Polaris3D™



Configure

Operate  
Brightness

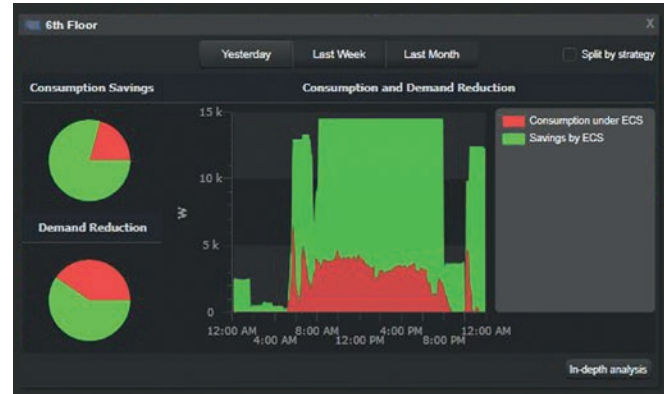
Analyze



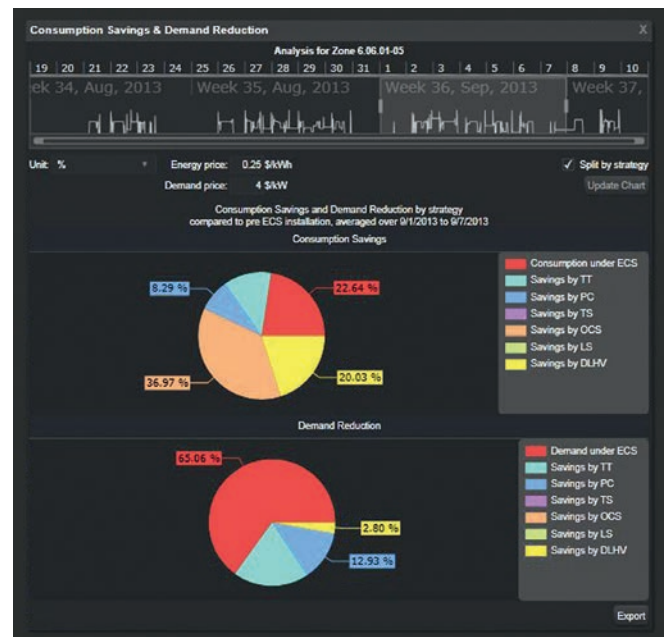
## The Polaris 3D™ software

Welcome to the next generation of lighting control from OSRAM: Polaris 3D™ is a web-based application that features an interactive three-dimensional view of buildings or complexes in real-time. You are now able to see buildings in a convenient 3D snapshot allowing for faster and easier navigation to desired control zones. Polaris 3D™ offers a unique colour gradient representation of lighting system data that enables the identification of inefficiencies or operational anomalies, focused on lighting status, lighting levels, load shedding status, lighting power density or energy consumption, occupancy status and comparative energy trends.

With Polaris 3D™, it's easy to produce energy savings reports for a day, week, month or year by clicking on any floor, zone or fixture. The software enables configuration of every system parameter in a single building or several buildings for each individual user or space, and establishes baseline settings for daylight harvesting, personal control, task tuning, smart time scheduling, occupancy control and load shedding.



**Descriptively:** Consumption saving and demand reduction analysis



**Detailed:** Analysis of consumption savings for each energy saving strategy

### The Polaris 3D™ benefits at a glance:

- Interactive three-dimensional view of a building
- Repurpose spaces without rewiring
- Change set points and schedules from your web browser
- User-defined security settings
- Coloured representation of the lighting system for easy collection of data:
  - Lighting status
  - Lighting power density and energy consumption
  - Occupancy status
  - Comparative energy trends
  - Load shedding status



## Easy-to-integrate hardware

Thanks to its flexible structure, ENCELIUM™ easily integrates each component. DALI is a daisy chain communication standard that supplies data and power to the system components.

Each light fixture, sensor and push button controller is daisy-chained back to the Energy Control Unit (ECU). This central intelligence node collects, processes and distributes lighting control information from photo sensors (light levels), occupancy sensors (occupancy status) and push buttons to the inputs and outputs over the DALI network. It then determines appropriate brightness levels or the ON/OFF status for each fixture and zone.

Each ECU has Ethernet connections for communication with other ECUs and the SSU on the ENCELIUM™ network and for communication with a facility or tenant LAN to allow secure communication with ENCELIUM™ equipment for access to the ENCELIUM Polaris 3D™ or Personal Control Software (PCS) applications.

The SSU serves as the database server for all data related to an ENCELIUM™ system. It stores all system settings and parameters, including attributes for zones, fixtures, sensors and push buttons. Additionally, it maintains multiple set points, including those for light levels, time schedules, occupancy sensor timeouts and demand response or load shedding features. The SSU logs historical data regarding the system's operational and energy savings results.

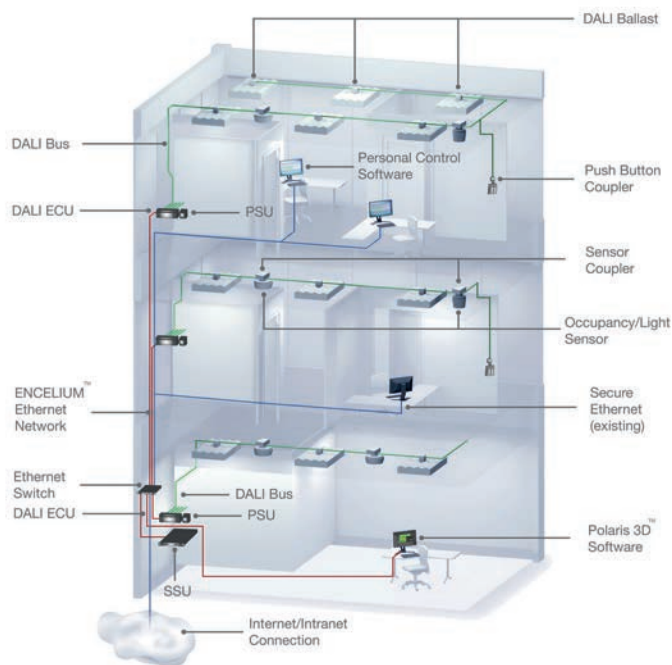
## DALI

DALI is an international standard, firmly established all over the world. Created specifically for digital lighting control, it provides a single interface for all electronically controlled light sources in an easy-to-install and versatile system. It has almost unlimited scalability, is easy to manage and is very cost-effective through energy savings.



### All suitable components at a glance:

More information can be found on page 23



ENCELIUM™ System Infrastructure

### The hardware benefits at a glance:

- Installation is quick and simple with standard DALI or RJ45 connections
- Integrates occupancy sensors, photo sensors and relay-based controls into a comprehensive, programmable lighting control system
- Makes it possible to integrate with other building automation systems, such as HVAC, fire and security
- Little programming effort required

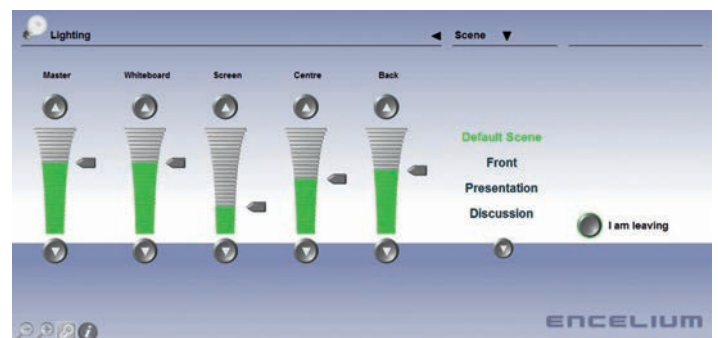
# Lighting has never been so flexible

With the ENCELIUM™ Light Management System



Lighting control is all about flexibility. A well-designed light management system like ENCELIUM™ ensures that all the components are responsive to changing conditions. When it comes to interoperability, the best basis is DALI, an especially flexible system that can be extended using other components. This opens up completely new possibilities, especially in terms of functionality, design and installation.

Even more convenience comes by the fact that changes in lighting are manageable without rewiring, simply using software and all this incredibly easily via remote access and with no need of dedicated expertise in programming or commissioning.



**Individual Control:** Personal Control Software for workplace lights to let the user control his own environment





### BMS systems

By connecting the two big communication standards, DALI and TCP/IP, ENCELIUM™ gives you a real boost in terms of flexibility in lighting. Flexibility now meets scalability enhancing the design and installation experience. Integration of DALI with a building management system becomes simple and flexible.

The lighting control system could also be a sub-system of a BMS. Through BACnet IP interface ENCELIUM™ responds to commands from the BMS control and DALI ballasts feed lighting system information back to the BMS, allowing automatic identification of failed lamps and ballasts as well as central monitoring of ballast power and dimming levels. A number of alternatives are possible, one being a pure sub-system within the BMS; another being a stand-alone system where important information (fault status, central switch functions etc.) is exchanged with the BMS.



**Easy to handle:** Spaces can be rearranged in the ENCELIUM™ system at the click of a mouse

# Lighting has never been so easy to control

With the ENCELIUM™ Light Management System



It's no secret that reducing energy consumption is good for the bottom line as well as for the environment. However, those responsible for making the decisions relating to building efficiency solutions are often not aware of all available options. These decision-makers place great importance on energy reduction and corporate social responsibility, but often the data and energy information is not available and if available not in an easy and comprehensive format.

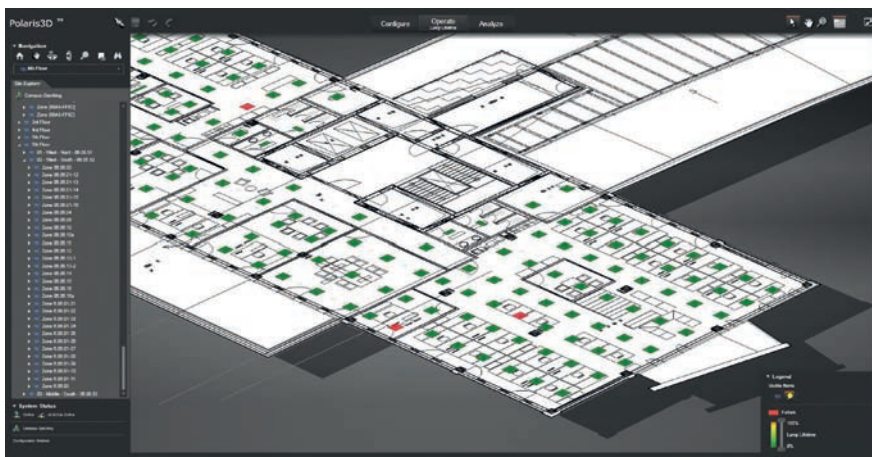
Monitoring the energy use is a proven solution that makes a tangible and visible impact. That is why more and more building owners are switching to energy monitoring solutions that let them automatically collect masses of data. In other words: useful information that helps them to understand and manage the energy usage.

Polaris 3D™ is the ideal software for this task. It ensures centralised control of the whole facility lighting and provides real time monitoring of lamps, burning hours and faults. And to make it to use as convenient as possible, it has an extremely simple navigation and system configuration, and shows floor plans and colour gradient.





**Integration:** Automatic functional and duration tests and reporting functionality of emergency lighting systems



**Useful:** Graphical overview of the lamp and ballast failures to allow immediate and targeted maintenance

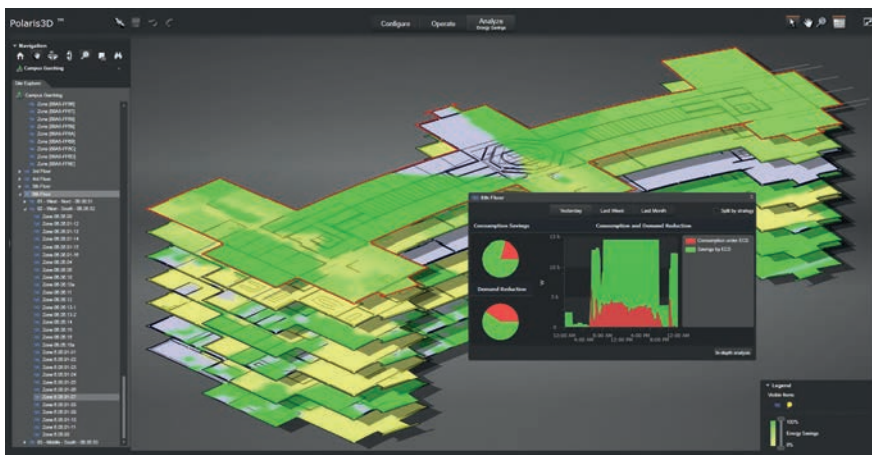
# Lighting has never been so energy-efficient

With the ENCELIUM™ Light Management System



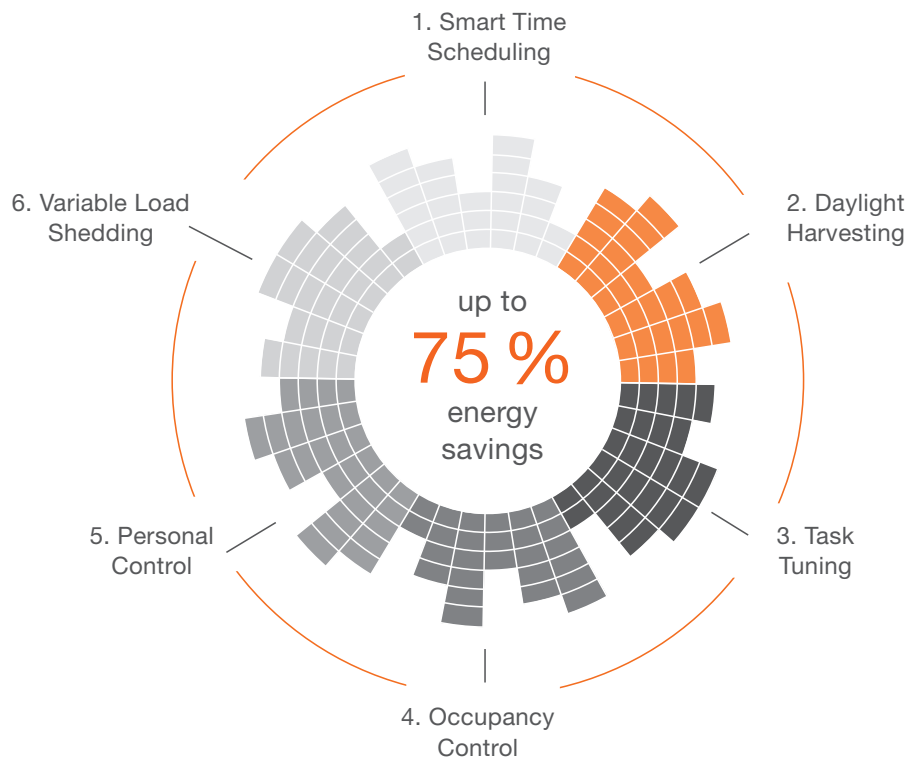
When it comes to light, there is a strong need for energy in every sector of life: from offices to schools, hospitals and commercial buildings. In fact, nearly 20 % of energy consumption worldwide is due to lighting. It is therefore hardly surprising that energy efficiency in this area is a major environmental priority.

A lot of options are available in the market, from the cheapest single dimmer solution to the complete automated building control. But only ENCELIUM™ enables complete building lighting control with up to 75 % energy savings and can be set individually to your needs.



**Impressive:** Colour gradient 3D view of the building, consumption saving and demand reduction overview





### The six strategies to save energy

ENCELIUM™ offers six strategies for saving energy, which are coordinated and optimised using sophisticated software algorithms. As a result, your lighting's energy consumption can be reduced by up to 75 % without compromising light quality. And of course, this also helps you gain points for building sustainability certifications like BREEAM or LEED.

#### 1. Smart Time Scheduling

In areas of a building where occupancy control is not appropriate, time schedule switching or dimming of lights can be employed for zones as small as a room or even an individual light fixture.

#### 2. Daylight Harvesting

Through the use of photo sensors, light levels are automatically adjusted to take into account ambient natural sunlight. To save energy appropriate light levels are maintained and artificial lighting is dimmed.

#### 3. Task Tuning

Eliminates “over lighting” by setting default (maximum) light levels to suit the particular task or use of a workspace.

#### 4. Occupancy Control

Through the use of occupancy sensors, lights are automatically turned on or off or dimmed based on occupancy detection.

#### 5. Personal Control

Through the use of ENCELIUM™ Personal Control Software, individuals can control the light levels in their workspace to suit their personal preferences from their desktop.

#### 6. Variable Load Shedding

The automatic reduction of electrical demand in a building by shedding lighting loads dynamically (through dimming or switching) either to shave peak demand or reduce energy consumption. Load shedding can be done selectively by lowest priority areas first.

# Lighting solutions for every need

## The application areas of ENCELIUM™

Different facilities call for different solutions in terms of energy management and cost reduction. To match the unique requirements of every commercial building, ENCELIUM™ provides a wide range of combination possibilities that cover every different application – to enhance the quality of light while also maximising your energy savings.

### Office

On average, lighting accounts for nearly 40 % of a commercial building's electricity consumption. These facilities therefore offer the largest opportunity for lighting energy savings while working with your existing lighting system. Quality office lighting control can increase a company's profits while simultaneously improving employee morale.

#### Challenge:

Reduce lighting energy consumption while providing the flexibility to adjust light levels for a wide range of tasks, personal preferences and office hours.

#### ENCELIUM™ solution:

- **Flexibility:** Zones can easily be reconfigured with the click of a mouse when the use of a space is changed.
- **Control:** Employees can set default lighting scenarios from their computers with ENCELIUM™. Thus they are able to tune and optimise the light level based on activity type.
- **Energy savings:** Time schedules are set to turn lights on/off at designated times. During the working day, the strategy is supplemented with occupancy control through dimming and switching. Networked occupancy sensors turn the lights on to preferred levels only when movement is detected. Daylight harvesting then rises the energy saving to the highest levels.



## Healthcare

Lighting impacts on every aspect of human health and performance. By bringing quality lighting into healthcare facilities, patients, visitors and staff benefit while the facility's bottom line improves.

### Challenge:

Reduce lighting energy consumption in areas that operate 24/7, while individual patients recover on unique schedules. Strategically lower light levels in adjacent corridor areas to encourage quiet at night.

### ENCELIUM™ solution:

- **Flexibility:** System integration options can link patient call button systems with lighting to provide remote control of dimming and scene selection.
- **Control:** ENCELIUM™ allows users to quickly select a preset lighting scenario that provides the right amount of light. Occupants and caregivers can adjust light levels with ENCELIUM Polaris 3D™ software. Employees can set and alter light intensity from their desktop PCs with ENCELIUM™ control software.
- **Energy savings:** ENCELIUM™ assures the lights are only on during occupied periods. Networked photo sensors enable the system to reduce electric lighting energy when natural daylight brightens the space. In addition, smart time scheduling uses dimming and switching to turn lights on/off based on the time of day.





## Education

Education facilities typically consist of a large array of buildings, each with differing uses and lighting requirements. Most of these facilities require long operating hours and rely on lighting to support a variety of functions.

### Challenge:

Reduce the lighting energy consumption of specialised multi-functional areas on campuses that facilitate peer interaction with teaching staff maintaining a productive environment for students, that encourages concentration. Enable easy scene setting to support the wide variety of presentation and learning modes.

### ENCELIUM™ solution:

- **Flexibility:** ENCELIUM™ groups fixtures into zones and allows to dictate time schedule switching or dimming. Zones can be programmed to reduce the use of electric light with the presence of natural daylight.
- **Control:** ENCELIUM™ can maintain customised lighting scenes from a desktop PC through the Personal Control Software. It stores preset scenes so faculty can easily modify light levels. Appeal to different personal preferences and study habits by creating areas with different illuminance levels. Well illuminated “secure zones” are created for spaces such as restrooms, lounge areas and exits to ensure safety at night.
- **Energy savings:** Dimming strategies may be deployed together with occupancy sensor based control of discrete rooms so that lights are switched off when not in use.



## Parking facilities

The need to address safety and security requires many parking facilities to operate their lighting systems 24/7. No other building type in commercial or industrial real estate has such continued usage outside of normal working hours. As lighting accounts for 95 % of a parking garage's electricity load, these spaces are ideal for lighting controls, which can reduce electric bills and promote sustainability.

### Challenge:

Reduce lighting energy consumption in a space that is normally brightly lit for safety and personal security 24/7.

### ENCELIUM™ solution:

- **Flexibility:** Time scheduling may be incorporated where volume varies by time of day or between weekday and weekend hours or to set curfew schedules.
- **Energy savings:** Strategically place networked occupancy sensors to guarantee a drive aisle is illuminated as movement is detected. For crime prevention, bi-level switching triggered by occupancy sensors may also be used as a way to highlight activity. ENCELIUM™ provides the ideal illumination for every task: for example, higher light levels are needed where activity is frequent or at crossings. ENCELIUM™ can initiate load shedding by either automatic command or by a manual trigger through the ENCELIUM Polaris 3D™ software.





# Comprehensive needs require comprehensive advice

## Service and support by OSRAM

If you want more information how ENCELIUM™ can help you to save energy in your building, OSRAM and its partners support you across all areas. No matter how big your expectations are, we will provide you with the best system design, assisting you in every single implementation step.

Even better, when it comes to light, OSRAM is your reliable partner that offers you over 100 years of experience with a comprehensive portfolio of lighting solutions, from components to luminaires and lighting controls.

Don't hesitate to contact us. We look forward to help you to light up your building.

### Further information about luminaires

[www.osram.com/luminaires](http://www.osram.com/luminaires)  
[www.osram.co.uk/luminaires](http://www.osram.co.uk/luminaires)

### Further information about ECG

[www.osram.com/optotronic](http://www.osram.com/optotronic)  
[www.osram.co.uk/optotronic](http://www.osram.co.uk/optotronic)

### Further information about ENCELIUM™

Find out more about the light management system and watch the product video:

[www.osram.com/encelium](http://www.osram.com/encelium)  
[www.osram.co.uk/encelium](http://www.osram.co.uk/encelium)



### Any questions?

If you need support for ENCELIUM™ projects, please contact us:




[encelium-support@osram.com](mailto:encelium-support@osram.com)



# All suitable components at a glance

## Software and hardware for ENCELIUM™

### Controllers

Image	Product reference	Product description	Product number
	ECU DALI	DALI Energy Control Unit (software Included)	4052899016842
	EN-SSU	System Support Unit – Server PC for rack mounting installation	4008321791535
	EN-SSU-BIF-KIT	System Support Unit – Server PC for rack mounting installation (BACnet included)	4006584794676


### Sensors

Image	Product reference	Product description	Product number
	LS/PD MULTI 3 CI	Light and presence sensor for ceiling installation	4008321916648
	LS/PD MULTI 3	Light and presence sensor for luminaire integration	4050300802138
	LS/PD MULTI 3 A-W	Light and presence sensor for luminaire integration with clip mounting	4008321653604
	LS/PD MULTI 3 B	Light and presence sensor for luminaire integration, with movable head	4050300803081
	LS/PD MULTI 3 FL	Light and presence sensor for luminaire integration, flat profile	4008321047342
	HIGHBAY	Motion sensor for high ceilings	4008321410078
	VISION	Motion sensor for large areas and corridors	4008321957047
	DALI LS/PD LI	DALI light and presence sensor for luminaire integration	4052899043954
	DALI Pro Sensor coupler	DALI Sensor Coupler for LS/PS MULTI3 family	4008321379269
	DALI Sensor coupler HF LS	DALI Sensor Coupler for HF LS sensor	4052899141728
	HF LS LI	Light and presence radar sensor for luminaire integration	4052899921481
	DALI HIGHBAY ADAPTER	DALI Highbay adapter with lighting detection function integrated	4008321774132
	DALI LS/PD CI	DALI light and presence sensor for ceiling installation	4052899930292


### User Interfaces

Image	Product reference	Product description	Product number
	DALI Pro PB coupler	DALI button coupler	4008321496461





### Integration Accessories

Image	Product reference	Product description	Product number
	BIF-600	BACnet dongle interface (USB stick)	4006584678938



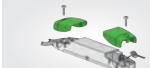


### Actuators

Image	Product reference	Product description	Product number
	DALI SWITCH SO	DALI-controlled 3 x Switching Actuator module	4008321533364

### Converters and Repeaters

Image	Product reference	Product description	Product number
	DALI REP LI	Repeater DALI and signal amplifier (luminaire or ceiling installation)	4008321292599
	DALI REP SO	Repeater DALI and signal amplifier (snap-on installation)	4008321301093
	DALI CON 1...10 LI	Converter from DALI to 1...10V (luminaire or ceiling installation)	4050300638973
	DALI CON 1...10 SO	Converter from DALI to 1...10V (snap-on installation)	4050300639802

### Accessories

Image	Product reference	Product description	Product number
	OUT KIT 30S	Protective casing	4008321159533
	LMS CI BOX	Strain relief	4008321083692
	ECO CI KIT	Strain relief	4008321392091
	PS 30	Power Supply for ECU DALI and DALI SWITCH devices	4008321555311
	LS/PD AP KIT	Ceiling mounting adapter for the DALI LS/PD LI Sensor	4052899173385

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