



Light is the solution ENCELIUM[®] Energy Management System

Light is OSRAM

ENCELIUM

OSRAM

ENCELIUM® Energy Management System

More flexibility, more control, more energy savings

Lighting scenarios change every day. A flexible lighting solution including controls which adapts to these conditions is ideal for these constantly changing scenarios. ENCELIUM by OSRAM is a scalable networked lighting control system that enables owners to elevate the cost effectiveness and occupant experience of their lighting spaces with just a click of the mouse. The ENCELIUM Energy Management System (EMS) dynamically responds to the changing characteristics of a building by providing the right amount of light when and where required.

Innovation

This fully software configurable system allows individual users to personalize their environments while enabling facility managers to program individual or groups of luminaires remotely. Accessible anytime, anywhere via an Internet connection, ENCELIUM's Polaris 3D offers color gradient visualization for hop count, signal route, wireless signal strength & battery status for wireless components and shows how efficient an installation is by immediately reporting the savings achieved in formats ranging from kWh to dollars, in any time frame desired. As a result, a facility manager can show all interested parties exactly how much lighting energy and carbon emissions their building is saving.

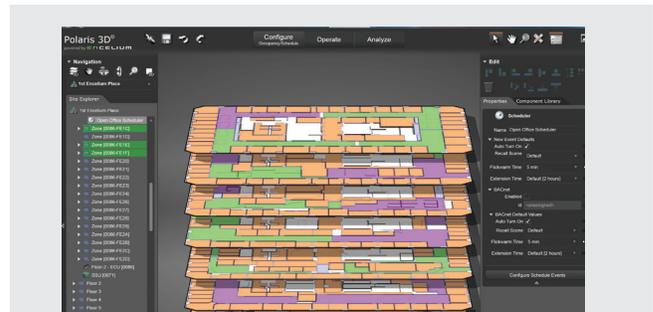
Flexibility

This fully software configurable system allows individual users to personalize their environments while enabling facility managers to program individual or groups of luminaires remotely. The flexible platform enables wired, wireless, hybrid communication and Internet of Things (IoT) scenarios.

Reliability

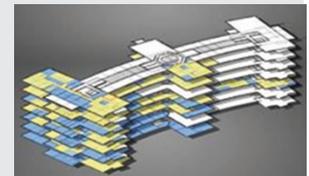
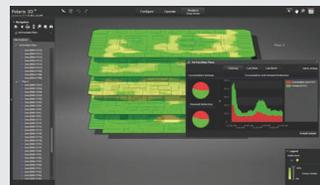
ENCELIUM technology has already proven its value: it has been impressing customers around the world for the last fifteen years and has demonstrated excellent reliability both when retrofitted and when used in new construction projects.

Improving the energy efficiency of buildings and reducing its operating costs is on the minds of many in today's economy. With the cost of electricity still on the rise, the reduction of energy consumption has become a major competitive advantage. As lighting regularly accounts for nearly 40% of a commercial building's electricity consumption, it serves as a prime target in these efforts to reduce overall electric usage, to lower electric bills, and to promote sustainability. Technology based lighting controls have been a major focus of industry-wide innovation, and the latest step forward comes in the form of the proven ENCELIUM Energy Management System (EMS) from OSRAM.



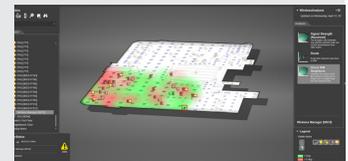
The ENCELIUM software dashboard is a unique and integral part of the Energy Management System, providing unprecedented control of a building's lighting energy usage with well structured tree site navigation and a 3-dimensional graphical overview.

Full building graphical views



Energy reporting

Number of hops from the controller



Route taken to reach the controller

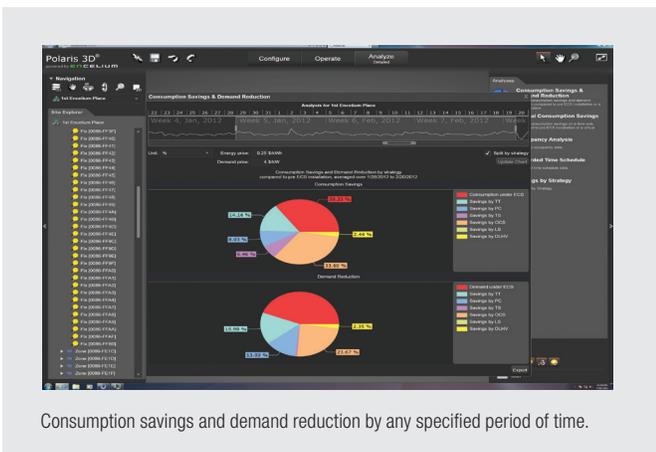
This best-in-class system puts the control of your building's lighting efficiency into your hands.

The next generation of lighting control software

ENCELIUM® Polaris 3D®

For over 15 years, this web-based software has offered building operators the enhanced ability to analyze and update a facility's lighting requirements and track usage. Facility managers can instantly rearrange lighting control layouts from one convenient interface. ENCELIUM Polaris 3D adapts to changes in building usage without any physical rewiring taking place, thereby reducing costs associated with lighting control changes in a building.

The ENCELIUM Polaris 3D software has the ability to display and communicate actual savings to building owners and investors. Facility managers can show their energy savings in various formats for any specified period of time. Reports generated can focus on an entire building all the way down to an individual luminaire, overall energy savings or be broken down by energy management strategy. Users can identify lighting-related inefficiencies or operational anomalies anywhere in a facility...so you always know how the system is working. You can survey, check and verify the lighting in your building or several of them in 3D with Polaris 3D. Zooming, tilting, or panning the view at the touch of a button helps you to optimize the lighting performance of your building.



ENCELIUM Polaris 3D Features:

- Offers a single 360° three-dimensional navigation of a building in a multi-floor view
- Allows for easier navigation to a desired control zone
- Gives users the ability to see an entire facility in a convenient snapshot
- Groups floors, rooms, individual luminaires or even desks into zones
- Allows access through a web browser

ENCELIUM Polaris 3D Benefits:

- Interactive three-dimensional view of a building
- Repurpose spaces without rewiring
- Change set points and schedules from your web browser
- User-defined security settings
- Colorized representation and reporting of lighting system data for easy detection of:
 - Lighting status
 - Lighting power density or energy consumption
 - Occupancy status
 - Comparative energy trends
 - Load shedding status
 - Wireless components battery life
 - Wireless components communication paths

ENCELIUM® BACnet® Module



BACnet enabled devices within ENCELIUM EMS architecture can now be part of an IoT platform regardless of their configuration (wired, wireless or hybrid). ENCELIUM controllers (ECU G4 & Wireless Manager) function as gateways for IoT.

The BACnet Interface Module enables the integration of the ENCELIUM Energy Management System (EMS) with any BACnet compatible building automation system.

The ENCELIUM EMS operates autonomously while lighting status, lighting levels and energy usage are all shared and may be controlled via BACnet. Connection between the two systems is established via BACnet/IP.

The BACnet Module:

- Reports daylight readings
- Enables BACnet switching and dimming control
- Provides load shedding control over the lighting load
- Notifies the ENCELIUM EMS of an emergency through a BACnet connected fire alarm input to turn all lights on
- Shares occupancy information obtained by the ENCELIUM EMS with a BACnet client to integrate HVAC with occupancy
- Allows schedules defined through BACnet devices
- Supports both centralized & distributed architectures

ENCELIUM AV Interface



The ENCELIUM AV Interface allows the integration of audio-visual systems to the ENCELIUM Energy Management System. Scenarios such as changing lighting, audio and visual to achieve a desired atmosphere can be recalled through an interactive touch screen.

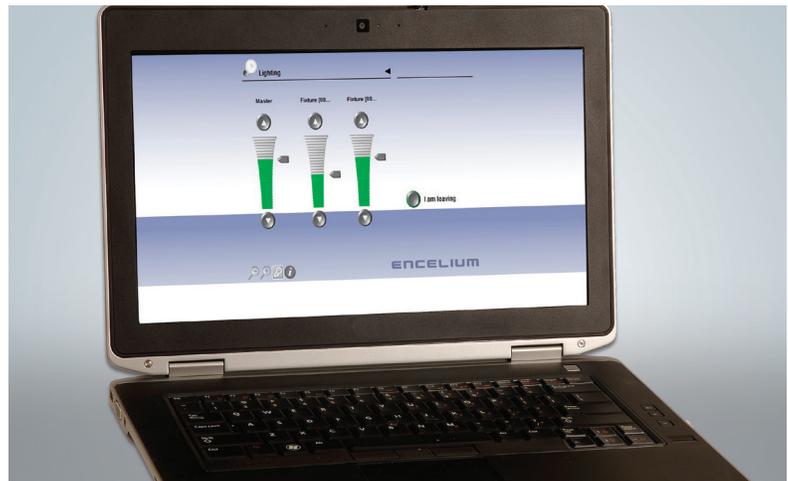


Personal Control Software can control light levels in larger spaces such as auditoriums or conference rooms.

ENCELIUM Personal Control Software

ENCELIUM Personal Control Software (PCS) enables individuals to control lighting levels in their workspace from their own desktop PC. For optimum comfort, it also stores preset lighting scenes so employees can easily modify their personal light levels to suit the task at hand.

PCS can also be used to control light levels in larger spaces such as boardrooms, conference rooms or auditoriums. In addition to the dimming functionality, PCS can be used to simply turn individual luminaires ON, DIM or OFF within that same workspace. Users can only control light luminaires assigned to their workspace. No additional hardware is required when using personal control software.



Recall pre-set lighting scenes or use as a slider dimmer based on individual preference or to suit a particular task.

Innovative Communication Networks

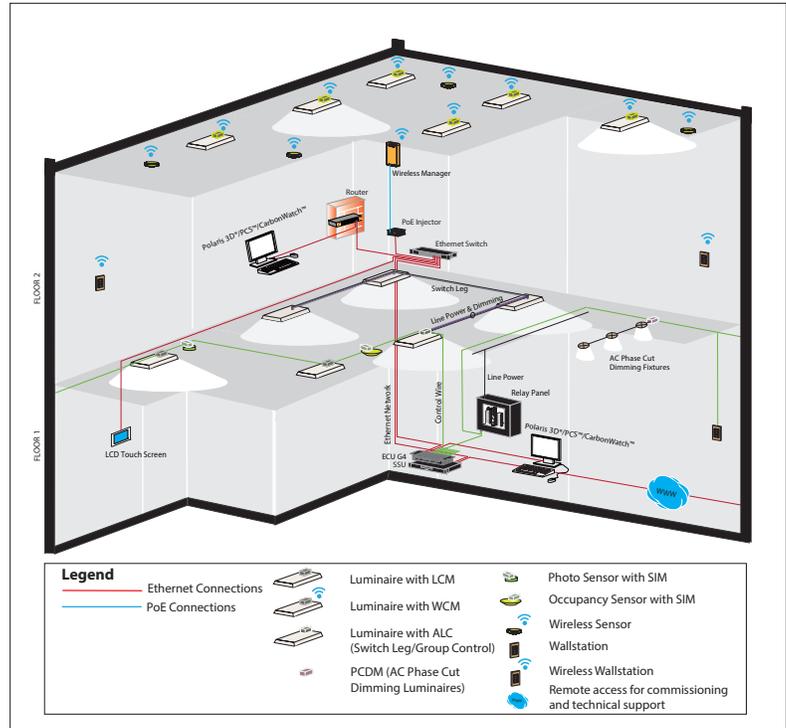
ENCELIUM® Energy Management Systems use the following networks: GreenBus II®, Wireless Mesh based on ZigBee® standards, or DALI (Digital Addressable Lighting Interface). These are cross platform systems that are compatible with each other so that you are no longer locked into a single, proprietary system. This not only offers flexibility but can scale to meet any need. These diverse options allow wired and wireless networks to integrate into hybrid ecosystems.

ENCELIUM GreenBus II

ENCELIUM GreenBus II is a two-wire communication platform for supplying data and power to the ENCELIUM Energy Management System. This next generation bus system dramatically raises the capability to deliver power to sensors and wallstations while increasing the number of devices supported by a single ENCELIUM Energy Control Unit (ECU). GreenBus II includes enhanced troubleshooting features such as the ability for the system to detect and locate field bus communication faults via the ENCELIUM Polaris 3D® software. In addition, the ENCELIUM EMS is BACnet® compatible for easy integration with building automation systems, such as HVAC, fire and security.

A flexible system with integration capabilities

Highly flexible, the network can integrate with both analog 0-10V dimming lighting systems and Digital Addressable Lighting Interface (DALI) lighting systems on the same platform. Where DALI ballasts are preferred, the system utilizes an ENCELIUM DALI Bridge as a gateway between the ENCELIUM GreenBus II field bus and the DALI ballasts. The DALI Bridge also allows for the mixing of Class 2 and Class 1 wiring within the same lighting system.



ENCELIUM GreenBus II is a two-wire communication topology for supplying data and power to the system. Each light luminaire, sensor, and wall controller is daisy-chained back to the Energy Control Unit (ECU) using pre-terminated 'click & go' ENCELIUM GreenBus II communication cabling. ECUs typically control individual floors and are linked via an Ethernet Network. Internet or LAN connection allows floor plan based control software to be operated anywhere on the network. GreenBus II can be combined with wireless for hybrid systems.

ENCELIUM GreenBus II features:

- Individual dimming control of thousands of luminaires
- Provides low voltage power to all devices on the network
- Network is created through pre-terminated 18 AWG 'click and go' connectors
- Can integrate with both analog 0-10V dimming ballasts/ LED drivers or standard non-dimming ballasts/LED drivers and DALI-based systems
- Self-monitoring function identifies and troubleshoots system problems to minimize disruption to the system
- Enable wireless sensors and wallstations with the wireless manager

ENCELIUM GreenBus II benefits:

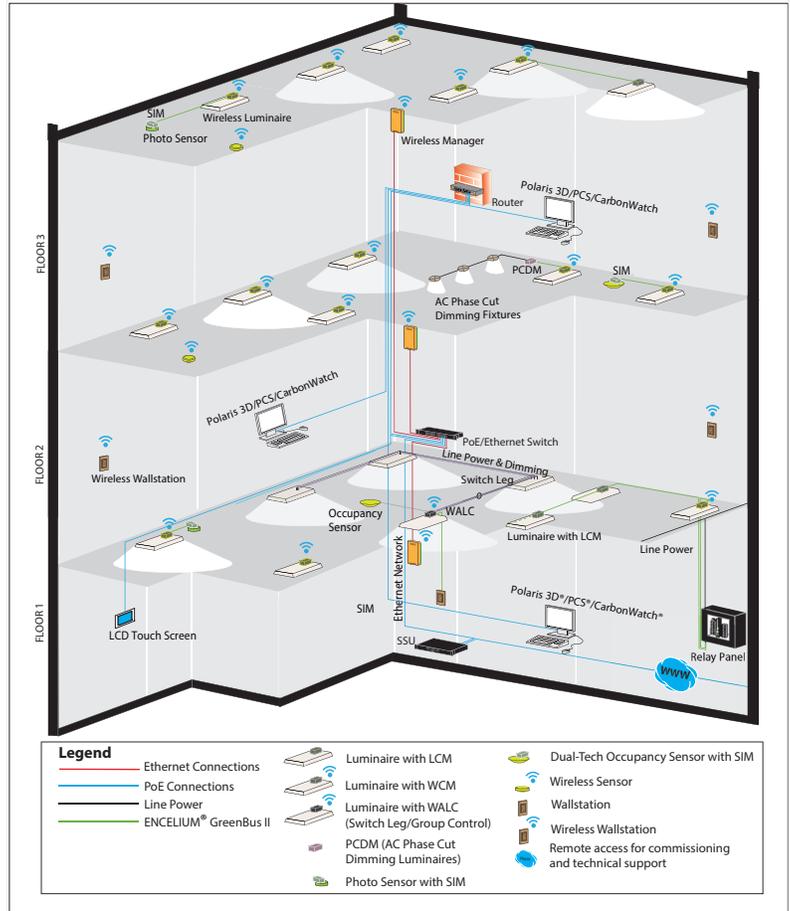
- Installation is quick and simple
- Integrates occupancy sensors, photo sensors and relay-based controls into a complete, programmable lighting control system
- Eliminates the need for external power supplies and power packs
- Offers the ability to integrate with other building automation systems, such as HVAC, fire and security
- Automatically detects and isolates breaks or faults in wiring

ENCELIUM® Wireless Network

OSRAM is a member of the ZigBee® Alliance. ENCELIUM's Wireless Energy Management System is based on open and interoperable ZigBee standards. This allows you to locate sensors and wallstations in hard-to-reach locations because no wiring is required. Each Wireless Manager can control up to 100 nodes allowing you the flexibility to provide cost effective controls to a variety of locations. The new wireless system includes enhancements to the ENCELIUM Polaris 3D® software that includes auto-backup to a Micro SD card, IP address recovering mechanism, and battery status view for wireless devices.

A flexible system with integration capabilities

Highly flexible, the network can integrate with analog, 0-10V dimming lighting systems and Digital Addressable Lighting Interface (DALI) lighting systems on the same platform. The addition of the wireless system also allows you to have a hybrid system using both wired (GBII) and wireless hardware components.



The ENCELIUM Wireless Energy Management System (EMS) communicates via a mesh network based on ZigBee standards. The Wireless Manager (WM) is powered using Power Over Ethernet (PoE). Each WM must be connected to an Ethernet (PoE) Network Switch using standard Cat-5 or greater Ethernet data cabling. Each WCM, sensor, and wallstation uses a wireless mesh network to relay data back to the WM. WMs typically control individual floors and are linked via an Ethernet Network back to the System Support Unit (SSU). Internet or LAN connection allow floor plan based control software to be operated anywhere on the network.

ENCELIUM wireless features:

- Individual dimming control of thousands of luminaires
- Network is a ZigBee standards-based wireless mesh network
- Can integrate analog, 0-10V dimming ballasts/drivers, standard non-dimming ballasts/drivers and DALI-based systems
- Award-winning sleek, aesthetic hardware
- Multiple mounting options including tool-less options
- Can be networked with ENCELIUM GreenBus II® products for hybrid system

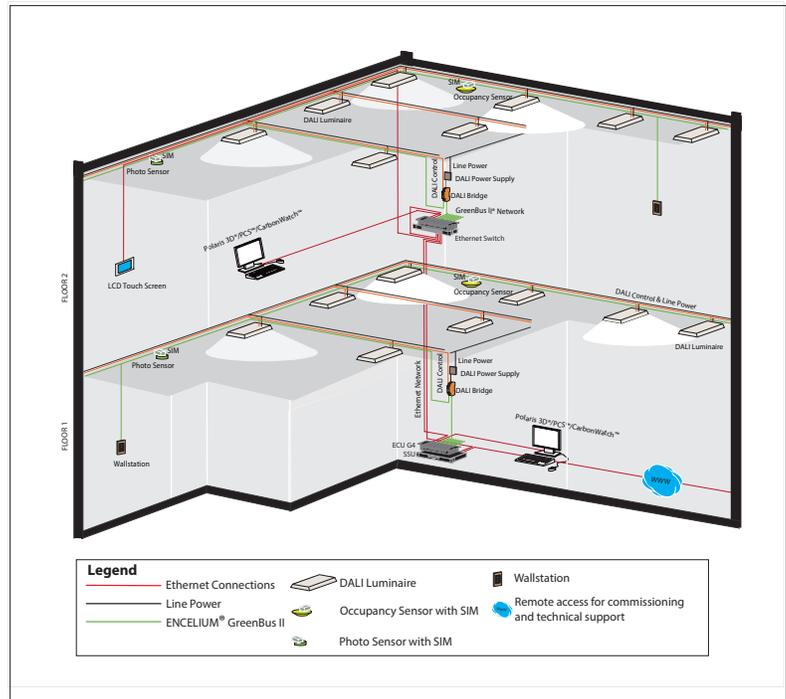
ENCELIUM wireless benefits:

- Complete flexibility in projects allowing access to hard-to-reach areas
- Self-healing wireless network with secure AES 128-bit encryption
- Versatile: control a variety of luminaires
- Seamless installation into the space, easy to install
- Ability to mix products for multiple applications with one Energy Management System
- Upgradable with new technologies

DALI (Digital Addressable Lighting Interface) Network

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. DALI is a daisy chain communication standard that supplies data and power to the system components.

Each luminaire, sensor and wallstation 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 luminaire and zone.



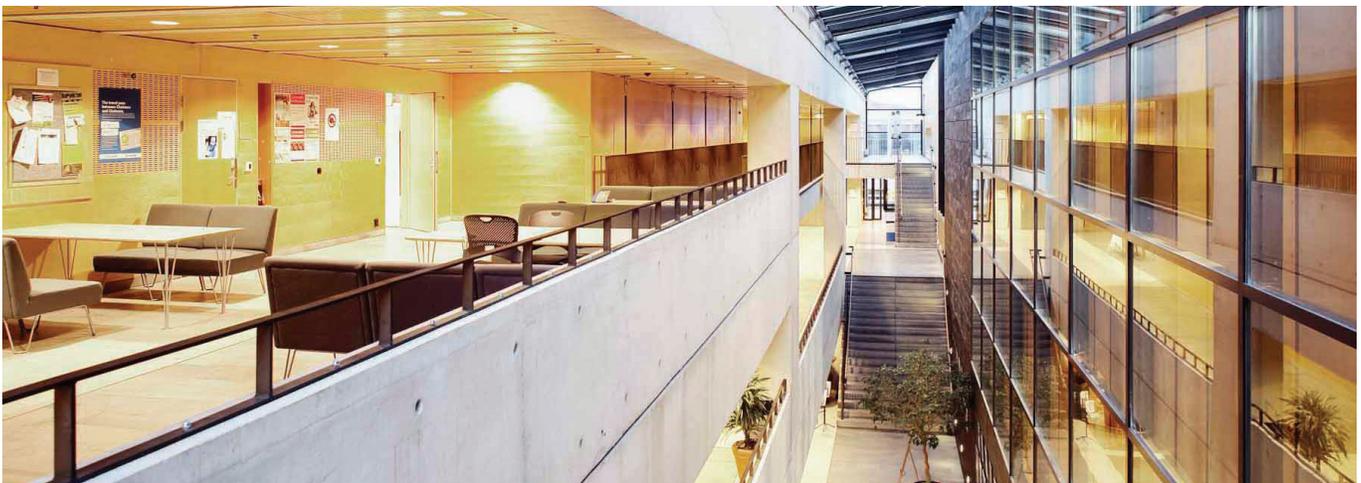
The ENCELIUM Energy Management System can incorporate DALI with the GreenBus II® and wireless networks.

ENCELIUM® DALI features:

- Integrates occupancy sensors, photo sensors and relay-based controls into a comprehensive, programmable lighting control system
- Little programming effort required

ENCELIUM DALI benefits:

- Installation is quick and simple with standard DALI or RJ45 connections
- Makes it possible to integrate with other building automation systems, such as HVAC, fire and security



ENCELIUM® Hardware

Wallstations



The ENCELIUM Wallstations offer a variety of options with fully configurable 2 button, 3-Scene and 3-Zone Control options. All come with standard wall plates for a single gang box and can be used with Decorator-style wall plates.

Wallstation features:

- Wall or surface mounted
- Wireless wallstations are battery operated with no wiring required
- Ability to select and dim lighting
- Configuration via GUI in a drag and drop format
- Wired wallstations may be combined with wireless systems for total flexibility

Wallstation benefits:

- Easy installation in new or retrofit applications
- Versatile with lower cost of installation
- Flexibility to control lighting in a variety of zones, scenes, dimming
- Combination of scene & zone in one wallstation
- Hybrid systems allow for flexibility to control lighting in a wide variety of applications

Sensors



The ENCELIUM sensors offer photo sensors, dual technology (PIR/US) occupancy sensors and PIR occupancy sensors with integral photo-cells. These may be ceiling mounted or wall mounted depending on type.

Sensor features:

- Wireless sensors offer multiple tool-less mounting options
- Sensors may be programmed through Polaris 3D to improve energy savings
- Wired sensors may be combined with wireless systems for total flexibility

Sensor benefits:

- Easy installation in new or retrofit applications
- Increased reliability to maximize energy savings
- Hybrid systems allow for flexibility to control lighting in a wide variety of applications

Control Modules



Highly flexible, the network can integrate with analog, 0-10V dimming lighting systems and Digital Addressable Lighting Interface (DALI) lighting systems on the same platform. The addition of the wireless system also allows you to have a hybrid system using both wired (GBII) and wireless hardware components.

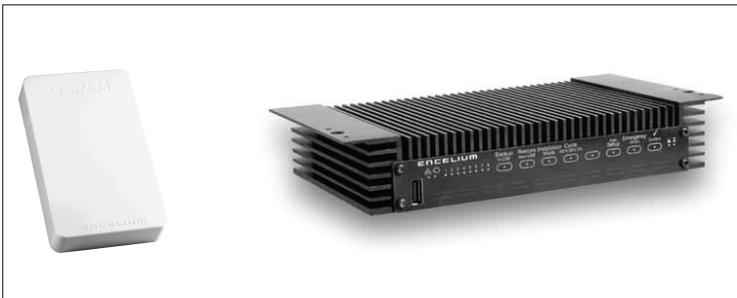
Control module features:

- Connects luminaires and sensors to network
- Individually addressable

Control module benefits:

- Allows customization of lighting scenes and light levels
- Independent control of components

Controllers



The ENCELIUM Controllers act as the central intelligence point for the area they control collecting signal information from sensors, wallstations and personal control software and determining appropriate brightness levels or on/off on/off status for each luminaire or zone.

Controller features:

- Wall, surface or ceiling mountable
- Information collection via Class 2 communication bus or wireless medium
- Large number of node control
- Gateway for IoT scenarios

Control module benefits:

- Hybrid architecture for new or retrofit applications
- Unlimited scalability

Why invest in the ENCELIUM[®] EMS



Reduce lighting energy up to 75%

Nearly half of a building's electricity usage comes from lighting. With the ENCELIUM system in place, you can greatly reduce your energy consumption and building's carbon footprint.

Gain unprecedented control of a building's lighting energy usage

With the click of a mouse, the ENCELIUM EMS enables you to identify and improve lighting inefficiencies.

Future-proof your lighting

The ENCELIUM EMS adapts to changes in building usage including LED installation, without any changes to the system's basic structure.

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 cannot 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 users.

Reduce cooling requirements

The ability of the ENCELIUM EMS to automatically task tune lights to lower levels also reduces cooling requirements during summer months and as a result lowers utility bills even further.

Competitive advantage

Increase your profit margin by cutting operational costs with the ENCELIUM EMS.

Receive financial incentives for use of a lighting control system

Large Federal and Utility incentives may be available for commercial building owners and designers of government buildings when an ENCELIUM system is installed concurrently with energy efficient lighting or in a building that already has energy efficient lighting. You'll save money simply by investing in the ENCELIUM EMS, in addition to the savings you will accrue from reducing your energy consumption.

LEED[®] Certification

Effective control of lighting energy consumption is critical in gaining LEED certification and addressable lighting controls can be an indispensable tool in achieving this goal. The ENCELIUM EMS may contribute up to 24 points in up to five LEED categories, more than half the points necessary to becoming LEED certified.

BREEAM Certification

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. The ENCELIUM EMS may contribute towards meeting BREEAM certification.

Improve workplace efficiency

Increase occupant productivity and tenant satisfaction by providing individual lighting control through the ENCELIUM Personal Control Software.

Winner of numerous Industry Awards

For more than 15 years, ENCELIUM has been at the forefront of technological innovation. ENCELIUM's ability to break new ground in energy management and occupant comfort has led to numerous awards for innovation, quality, and industry advancement.

IES Progress Report



Wireless Wallstation & Wireless Sensor

Buildings Journal Money Saving Product 2015



ENCELIUM Wireless System

Facility Executive Readers Choice Award 2015



ENCELIUM Energy Management System

Consulting - Specifying Engineer: 2015 Product of the Year



Wireless Sensor

AIA 2015 Conference: Top Product Pick for Specifiers



ENCELIUM Energy Management System

IES Progress Report



Wireless Area Lighting Controller

Design Journal: Best of 2015 Product



ENCELIUM Wireless System

ADEX Platinum Award



ENCELIUM Wireless System

ADEX Gold Award



Wireless Sensor

ADEX Silver Award



Wireless Area Lighting Controller & Wireless Wallstation

LFI 2016 Innovation Award



Connected Lighting Module

Smart control strategies

The ENCELIUM® Energy Management System is the only lighting control system that seamlessly employs these energy management strategies simultaneously. These strategies work in concert with one another to achieve overall building energy savings.



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 luminaire.



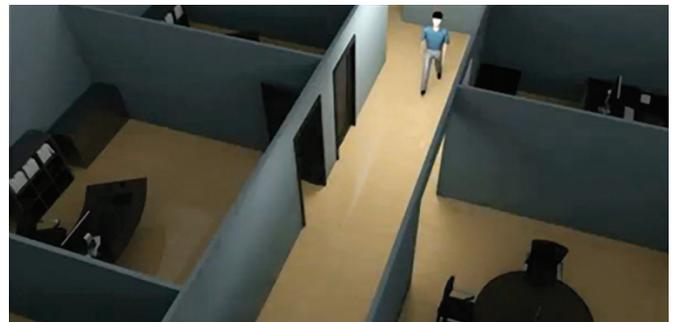
Daylight Harvesting

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



Task Tuning

Eliminates “over lighting” by setting default (maximum) light levels to suit the particular task or use of a workspace. This can be used for lumen maintenance.



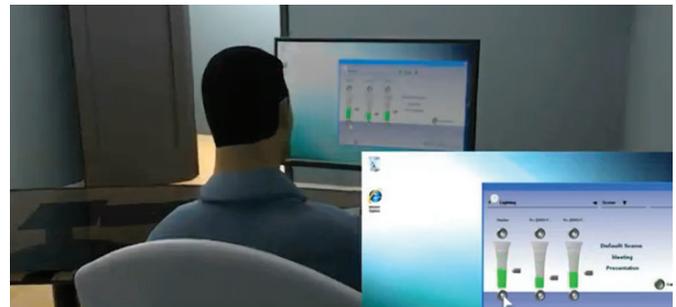
Occupancy Control

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



 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.



 Personal Control

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



 Plug Load Control

Plug load control can be used to control energy consumption of receptacle loads and can be combined with other control strategies to maximize energy savings. This can also satisfy newer energy codes.

The ENCELIUM Energy Management System (EMS)

provides maximum energy savings when combining the smart control strategies as well as other energy savings techniques. The ENCELIUM EMS can be integrated with other building management systems including HVAC, shade control and fire alarm systems for further controllability. Further savings can be generated through controlling emergency lighting. This system powered by its flagship lighting management software, Polaris 3D®, is continually upgraded to integrate new features and strategies to maximize controllability now and into the future.

OSRAM

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