

**Added value
thanks to
lighting
management**

Sustainable, intelligent, versatile:
LUXMATE systems point out
the future path for lighting.



References



For more references, please refer to the online Map of Light:
zumtobel.com under the "Lighting Solutions" menu option

Offices and Communication Edificio Fundación Caixa Galicia, La Coruña, ES / Government building, Stubenring, Vienna, AT / Raiffeisenbank, “The Wave”, Vienna, AT / Talk Talk, London, UK / Wiener Städtische Versicherung, Vienna, AT / World Bank Headquarters, Bucharest, RO **Education and Science** Bern University of the Arts, CH / Bünz matt School, Wohlen, CH / ISG, Rostock, DE / Northern Design Centre, Gateshead, UK **Presentation and Retail** EHB Elektro Hediger AG, Brunnen, CH / Hymer Motor homes, Bad Waldsee, DE / Kühnis Optics & Spectacles, Altstätten, CH / Mercedes-Benz Center, Cologne, DE / Stockholm City Galleria, Stockholm, SE **Hotel and Wellness** Hotel Belvoir, Rüs chlikon, CH / Hotel Budersand, Sylt, DE / East Sporting, Hamburg, DE / Restaurant Lindenlife, Berlin, DE / Sporthal Lipahal, The Hague, NL **Art and Culture** Albertinum, Dresden, DE / German Historical Museum, Berlin, DE / Lentos Art Museum, Linz, AT / Muzey Mir Vody, St. Petersburg, RU / Städel Museum, Frankfurt am Main, DE **Health and Care** Casa di Cura privata Sanatrix, Rome, IT / Centre Neurologique, Fraiture-en-Condroz, BE / Dialysis Centre, Herne, DE / Gmunden Regional Hospital (LKH), AT / Interklinik Bratislava, SK / Klagenfurt Regional Hospital, AT / Wolfson Medical School, Glasgow, UK **Industry and Engineering** Hugo Boss Shoes & Accessories Italia SpA, Morrovalle, IT / Kramer Allrad, Pfullendorf, DE / LU General Biscuits, Herentals, BE / Studer Cables AG, Däniken, CH / Technogym, Cesena, IT **Façades and Architecture** Gaislachkoglbahn cable car, Sölden, AT / OC Mirage Žilina, SK / Planet Planai & Skygate, Schladming, AT / SAGIA, Jeddah, SA / Schramm’s restaurant, Hallertau, DE

Reykjavík University | IS

Architects: Henning Larsen Architects, Copenhagen | DK

ARKIS Architects, Reykjavík | IS

Lighting design: VERKIS, Reykjavík | IS

Electrical installations: Rafmiolum hf, Reykjavík | IS

Lighting solution: LITENET lighting management system,
ONLITE emergency lighting system, RU-SLIMLIGHT,
Z-fourtyfive special luminaire, PERLUCE surface-mounted
luminaire, FEW louvre luminaire, VIVO spotlight



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The future of lighting management

From pioneer to trendsetter

What motivated you, more than 20 years ago, to develop a special-purpose lighting management system?

Walter Werner In the winter of 1987, an electrical consultant asked us to recommend a lighting control system. He showed us his wish list for a perfect system. At the industry trade fair in Hanover that year we were unable to find anything suitable. So we decided to develop such a product in-house and came up with many ideas of our own and took into account other customers' preferences over a period of several years.

What distinguishes the LUXMATE philosophy from other manufacturers' product concepts?

Walter Werner Zumtobel concentrated on lighting-focussed requirements: a large number of devices, often installed in the ceiling, rapid switching, simple operation, gentle dimming, reliable lighting control without oscillation effects. This gave rise to the concept of lighting scenes, combined blinds control and daylighting using a central daylight measuring head, the LUXMATE bus which offered features that are outstanding even by modern standards, and a range of control units that make complex settings easily accessible.

The sector has experienced breathtaking growth since LUXMATE products were first launched. What were and are the key success factors in your opinion?

Walter Werner Our Sales department provides professional advice at the start of every project. Our products are designed in a way that focuses on individuals and their needs. Over the years, we have added a large number of useful functions and devices which, when used in combination, produce a perfect lighting solution. In doing so we don't just think about end-users, we realise that products also have to be right for electrical consultants and electrical contractors. Our control systems, for instance, support immediate testing after installation without any prior commissioning or addressing.

What makes a perfect lighting solution?

Walter Werner A lighting control system must cater for people and their needs. This always involves striking a balance between automated intervention to influence the lighting situation and individuals' freedom to make adjustments. Light of varying colour and intensity is essentially not distracting as long as it is properly controlled.

How would you describe Zumtobel's roadmap?

Will the company continue to invest? What are your plans?

Walter Werner We attach great importance to using our control systems to exploit the capabilities of LED technology. The challenge is to integrate new technologies. The way lighting is operated has to be adapted to take into account changing habits. Building automation has now become widely established. Our task now is to exploit open standards and push ahead with networking. However, despite all this technology, we must never lose sight of human factors and individuals' wishes and abilities.



At Zumtobel Dr. Walter Werner is regarded as the father of lighting control systems. Dr. Werner has a PhD in physics, joined the company in 1985 and marketed the first lighting control system in 1991 – LUXMATE PROFESSIONAL. This system is now available in various product ranges and is subject to ongoing product development.



Flexibility put to the test: Swiss Re Germany's administrative building in Munich was equipped with a LUXMATE lighting control system over 10 years ago in an effort to ensure optimum convenience and efficiency even against the backdrop of changing requirements. The latest LITENET incontrol PC-based operating software was recently installed in this system.

From every angle

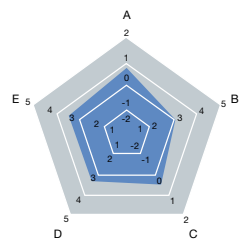
Lighting management meets the needs of various stakeholders



The individual: Combining the pleasant with the useful

Simple operation, convenient ways of intervening in automated operation and optimal amounts of daylight: LUXMATE control systems are built with humans in mind.

Five criteria define lighting quality, and most of these Ergonomic Lighting Indicator (ELI) factors are significantly influenced by the lighting control system used. Brightness distribution, light colour and illuminance optimise a lighting solution and the effect that it has on people.



ELI, Ergonomic Lighting Indicator
Lighting quality based on five criteria:
A Visual performance | B Vista |
C Visual comfort | D Vitality |
E Empowerment

LUXMATE makes the right light for a particular usage scenario available at the push of a button. Carefully thought-out lighting scenes are defined in advance, stored, recalled and modified as required. Every scene is assigned a name and an icon that is found on all control units – with a wide raft of manual operating capabilities: these range from momentary-action switches to a graphical user interface in a web browser; user-friendliness is always the prime concern. Lighting scenes are automatically activated by presence detectors or time entries.

Daylight-based control cleverly integrates daylight, which is indispensable for humans, into the lighting solution and helps strike the perfect balance between efficiency and lighting comfort. Built-in blinds control ensures automatic glare protection while also preserving a visual connection to the outside environment. Automated control can be manually overridden at any time; this ensures high levels of user acceptance.

Dynamic lighting solutions deliver a particularly pleasant user experience if they follow the natural rhythm of the sun and the quantity, direction and colour of light alter depending on the time of day and season. Zumtobel has developed concepts that reproduce this interplay indoors in a manner which deliberately boosts people's performance and is in harmony with their natural daily rhythms.



LITENET incontrol
Web-based software for operating a computer or a tablet PC



CIRIA
Control unit and controller



CIRCLE
Multifunction switch



Facility managers: Improved safety through work efficiency

Always being able to see the status of an installation at a glance, being given information about faults quickly, and being able to make modifications with relatively little effort: facility managers perform a wide variety of different tasks and LUXMATE control systems provide perfect assistance.

Software specially developed to meet the needs of facility managers provides plenty of ways to obtain information and analyses. System reports and alarms are delivered on various output media such as LUXMATE PC software, text messages or e-mail to ensure extremely high levels of safety and security. The facility manager is given timely information and has an overview of the situation at all times. Integrated emergency lighting makes it possible to automate legally required function tests, thereby reducing the workload of service personnel considerably. Time-consuming troubleshooting is now also a thing of the past.

LUXMATE is ideally prepared to cope with repurposing. Flexible structures and functions pave the way for flexible workstation design. A consistent addressing system allows spaces to be rearranged without having to modify any wiring. Adjustments are made simply via software.

Besides complete installation and commissioning of a system, Zumtobel also offers plant-specific training courses for facility managers and building services specialists. First-hand support is provided through optional remote maintenance or under the terms of a maintenance contract with a Zumtobel service expert based in the customer's vicinity. In addition, individually tailored maintenance contracts offer users the peace of mind of an efficient lighting control system throughout the entire service life of an installation.



Improving safety

Automatic checks and function tests, unambiguous error messages and defined emergency operating features are distinctive aspects of LUXMATE and guarantee a high level of safety.



System grouping

The flexibility of a LUXMATE lighting solution gives you the option of dividing up or merging rooms any way you like. For instance, several single-person offices with a corridor (left) can be transformed into a team office (centre) or a conference room (right).

From every angle

Lighting management meets the needs of various stakeholders



Electrical consultants and lighting designers: Scope for design preferences

The modular, consistent LUXMATE concept caters well for the designers' requirements. System limitations are not restrictive; the system's topology and range of functions ensure optimum scalability. Tried-and-tested software algorithms are available for all applications.

From individual rooms to spacious building complexes, LUXMATE control systems can meet practically any project requirement. For offices, educational establishments, shops or industrial applications, Zumtobel is an expert in lighting solutions for specific applications and can supply the right product portfolio and range of functions. Zumtobel's service and support are equally custom designed. Planning and design assistance, from project management right through to commissioning, is geared towards the customer's preferences.

LUXMATE systems are open and compatible. They use open standards, communication protocols such as TCP/IP, DALI or DMX, and are easy to install using standard wiring accessories. All modules are CE-certified, EMC tested and can therefore be used without any problem.

Pressing demands for greater energy efficiency are confronting designers all over the world with fresh challenges. LUXMATE combines good efficiency with proven reliability. This is underpinned by extensively tried-and-tested digital technology, mature control functions, a proven, efficient commissioning methodology and excellent emergency operating features. This means that there are no obstacles to achieving successful building certification.



Service and advice

From pre-sales support and project management through to commissioning: the extent of the support provided is dictated by customers' individual preferences. We are happy to provide planning aids such as CAD symbol libraries and VISIO templates for small systems or building-wide networked solutions.

Extensive information can be found in the LUXMATE Knowledge Base at kb.zumtobel.com

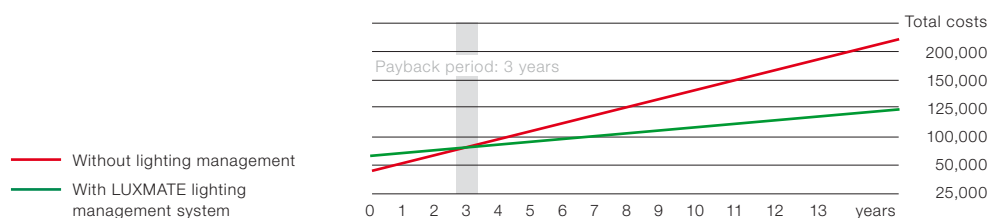


Investors: Profitable success thanks to flexibility

Time is money. This is why many investors are keen to fix the layout and functionality of lighting at as late a stage as possible. With LUXMATE you can remain flexible – in every phase of a project and later during normal operation.

The intelligent LUXMATE system includes the option of only activating functions when they are actually needed and, for instance, only automating individual rooms at a later date when required. This preserves economic efficiency despite the freedom to make changes – with precisely calculatable costs, from the bidding stage through to eventual operation. And LUXMATE taps into all potential energy savings, thereby smoothing the way towards successful building certification.

Zumtobel professionals assist the customer at every stage of a project: from the initial design concept right through to requests for proposals and realisation. Well-trained Zumtobel service engineers who receive regular in-service training or certified service partners ensure trouble-free commissioning and adjustment of the control system in the case of large, complex installations. We also offer maintenance contracts with clearly defined service level agreements that ensure an installation continues to deliver added value over its entire life cycle.



The lighting solution's payback period

LUXMATE lighting control systems shorten the payback period of a lighting solution thanks to reduced operating and adaptation costs. The Return on Investment time can be determined quickly and easily by using Zumtobel's ecoCALC software. This calculation software can be downloaded free of charge from zumtobel.com/ecocalc

Trends in lighting management

Saving energy

Daily routine

It is easy to continuously save energy with the help of a smart system. Working hours, attendance and, above all, daylight open up a wide range of ways of achieving potential savings. These are associated with CO₂ reductions, which enable a building to score extra points when it comes to environmental certification. Lighting refurbishment also pays for itself quickly thanks to drastically lower operating costs.

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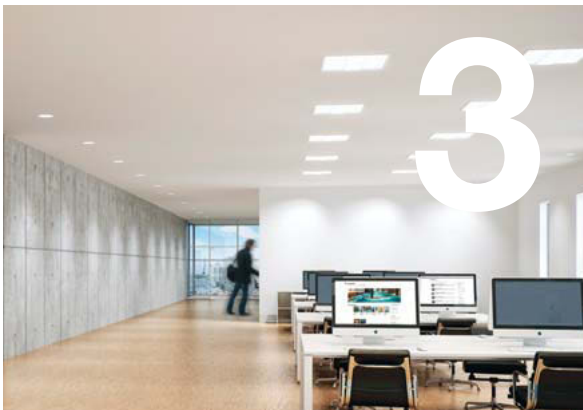
Using daylight

The best light is free

People and architecture live by light. The quest for ideal amounts of daylight and natural lighting quality can be accomplished by perfectly coordinated lighting and blinds. This makes sure that people who are working are not affected by glare and rooms are not overheated. It also preserves a link with the external environment and provides ideal working conditions while consuming as little energy as possible.

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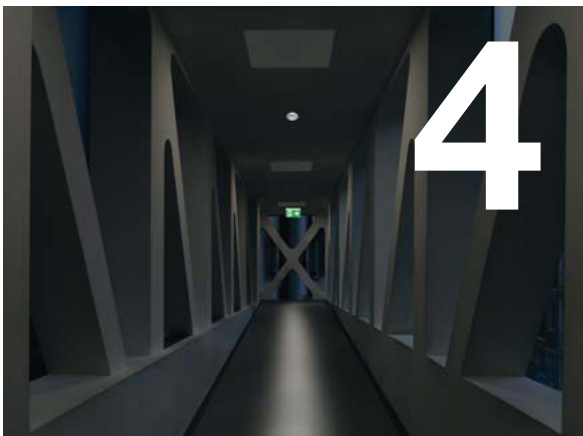


Changing colour temperatures

At the right time, at the right place

The right colour temperature has a huge impact in determining, for instance, whether a product is purchased, an art object reveals its true fascination or people feel at ease. Zumtobel has developed a broad range of luminaires and lighting control technologies, ranging from the facility to select various white tones incrementally through to dynamic changes of colour temperature and quantities of light, in order to exploit these possibilities in a profitable way in various applications.

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Integrating emergency lighting

Added value thanks to synergies

ONLITE luminaires and emergency lighting systems are a perfect fit with the LUXMATE LITENET lighting control system. Not only do they use the same DALI control circuits, all the luminaires are integrated into the system as well: every escape sign luminaire, emergency luminaire and general luminaire which functions as an emergency luminaire in the event of an emergency is part of a highly functional, closely monitored system.

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1 Saving energy

Building certification

There is a marked trend towards environmental certification of buildings, which is reflected in a rapidly growing large-volume market. In 2010, green buildings accounted for 35 percent of all newly built buildings, a figure that is equivalent to US\$ 54 billion for a market volume of US\$ 154 billion. By 2015, this figure is expected to increase to up to 48 percent of the anticipated total volume of US\$ 302 billion. In the same period, the market share accounted for by refurbishments will nearly treble.

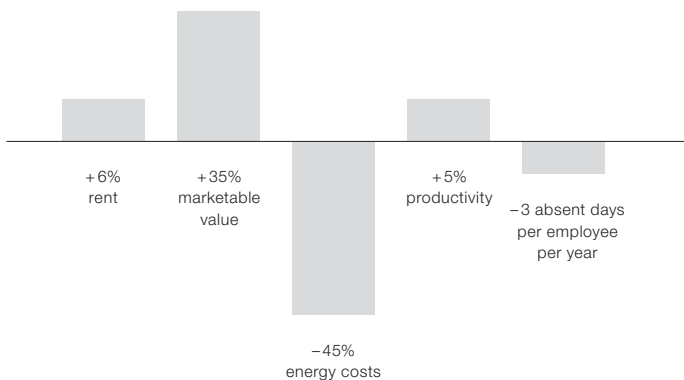
Benefits of certification:

- Value of the property increases
- The property is easier to market
- Tenants accept higher rents
- Operating costs are significantly curbed
- The CO₂ balance of the company is improved due to reduced consumption of resources
- Certified buildings are a useful tool for corporate and brand communications

Environmentally certified buildings have a demonstrably positive effect on employees and hence the success of a company thanks to cutting-edge structural measures such as air-conditioning, lighting or interior design. Surveys conducted by UK commercial property and real estate services adviser CBRE and the University of San Diego prove that certification is associated with:

- Higher employee productivity
- Enhanced sense of well-being among employees
- Reduced absenteeism due to illness

Besides a highly energy-efficient combination of luminaires and lighting management, Zumtobel also offers practical assistance during certification. The requisite Environmental Product Declarations (EPD) are available for a growing number of Zumtobel products.





SALEWA Headquarters in Bolzano | IT

Architects: Cino Zucchi Architetti and Park Associati, Milan | IT
 Electrical consultants: Energytech, P.I. Gabriele Frasnelli, Bolzano | IT
 Lighting solution: LUXMATE EMOTION lighting control system,
 ONLITE CPS emergency lighting system, PURESIGN escape sign luminaire,
 RESCLITE LED emergency lighting, IBLA special office luminaire,
 MELLOW LIGHT IV recessed luminaire, SLOTLIGHT II light line,
 TECTON Slimline continuous-row lighting system, LINARIA batten luminaire,
 PERLUCE recessed luminaire, LIVIANO spotlight, ONDARIA circular luminaire
 Photo: Oskar Da Ritz

330 tonnes of CO₂ emissions less every year

Pre-certified by ClimateHouse Work & Life, sustainability certification specifically for office buildings, firms and service providers

1 Saving energy

Combining intelligent strategies

Effective luminaires and light sources are the first step. Highly efficient products such as Zumtobel's LED luminaires make saving energy a sure-fire success. Energy consumption drops by around 25 percent where luminaires are fitted with modern, electronic control gear that has a dimming function. Lighting that is only switched on when it is actually needed is the most frugal of all. Presence detectors or predefined switch-on times, recorded, for instance, in LUXMATE LITENET's central building calendar, can reap potential savings of 20 to 40 percent.

Natural daylight, which is available free of charge and is the most acceptable kind of light, provides the most efficient lighting of all. Perfect daylighting makes it possible to save up to 75 percent of the energy used for lighting in functional buildings. This free daylight that enters buildings can still be used even if there is sunshading and glare protection. Properly coordinated control of lighting and blinds reduces the cooling load of a building and improves lighting quality as well.

Maximum energy savings are achieved by aggregating all potential savings and continuously maintaining an installation by opting for an individually tailored Zumtobel service package, for instance. The result is greater independence in the face of energy price increases and a sustainable drop in costs and CO₂ emissions over a period of many years.



The great effectiveness of a LUXMATE control system is clearly evident in the energy performance certificate. Here is just one of many examples: with annual energy consumption of 10 kWh/m², Energie AG in Linz, Austria, achieved an A+ rating.



Luminaires and light sources



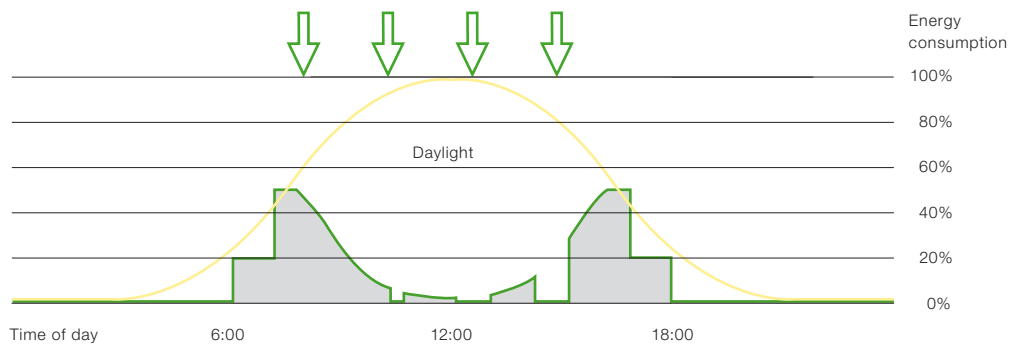
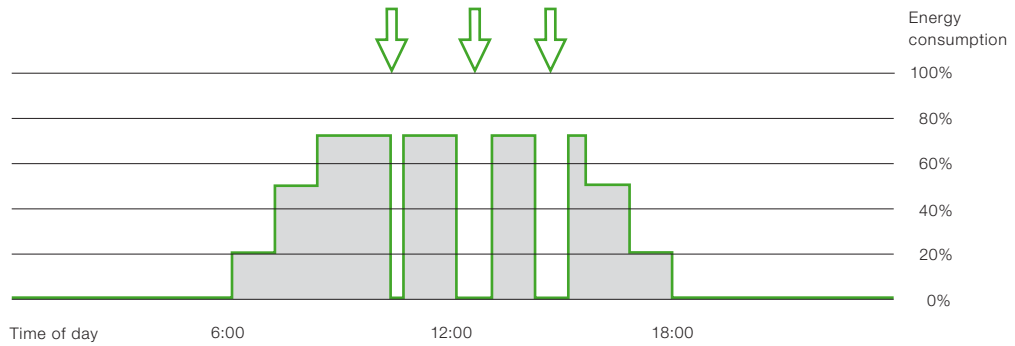
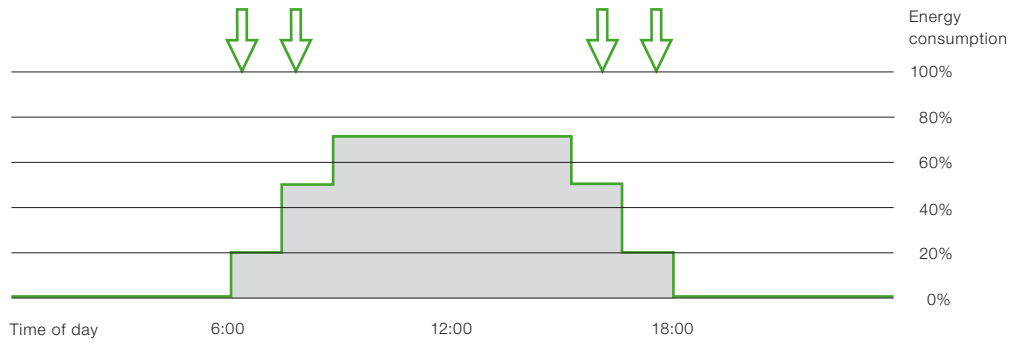
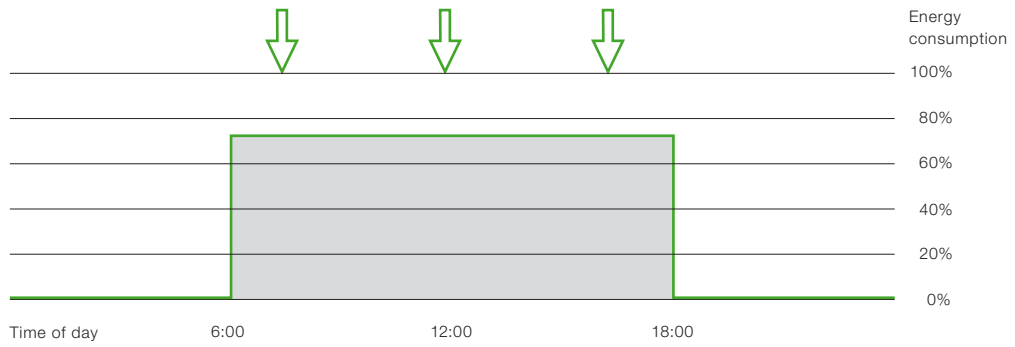
Time-based management



Presence detection



Daylight



2 Using daylight

Added value for people and architecture



Light is the elixir of life

Natural light is varied and creates a special atmosphere. Outdoor illuminance can vary from 100,000 lux on a summer day to 5,000 lux on a cloudy winter day. Directional sunlight and diffuse light from the sky create dynamic lighting scenes, and the colour of this light changes in a 24-hour cycle. Changing light colours and illuminance levels influence the production of hormones in the human body. In turn, these hormones stabilise the circadian sleep-wake rhythm and help to stimulate us, make us feel at ease and help us keep track of time – scientific findings suggest that the effects of hormones are even stronger than social factors such as working hours and meal-times.



People and daylight

Dynamic changes in natural daylight lay the the foundation for our sense of well-being. However, we spend a large part of our lives in artificially lit rooms. Insufficient daylight can mean that there is not enough information for the human circadian rhythm to work properly. This is why artificial lighting should be regarded, as Swiss industrial psychologist Helmut Krueger puts it, as a “dynamic design for a three-dimensional visual room climate” rather than a rigid, homogeneous installation. Optimal lighting not only takes into account different room situations; above all it caters for human needs. This necessitates continuous adjustment to suit individuals’ sight, work tasks and activities as well as changes that are consistent with prevailing weather conditions, time of day and seasons. Intelligently controlled lighting such as this boosts motivation, aids concentration and improves the quality of life in every office, factory bay and public building as well as in sports and leisure centres.

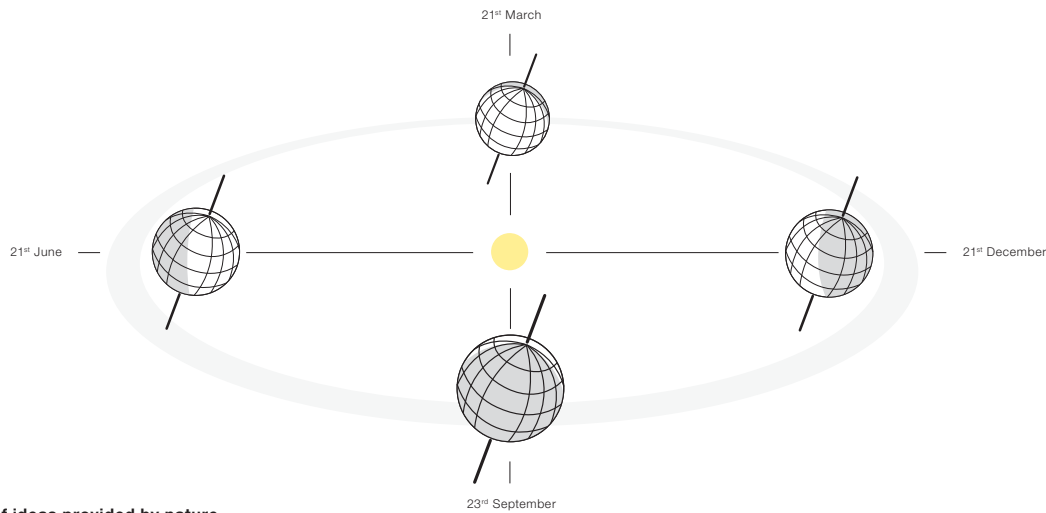


Architecture and daylight

Functional and creative lighting design are essential elements of architecture. Spaces cannot be experienced unless there is light. Every energy-saving construction project starts with intelligent daylight-based design. Generously dimensioned glazed panels are an effective way of getting as much daylight as possible into a building. Just like human skin, the shell of the building needs protection in this case, and this is when the designer’s thoughts turn to glare protection. Optimally coordinated luminaires and control systems provide premium quality lighting solutions that consume comparatively little energy. Almost every new building is equipped with a control system nowadays, and even refurbishment projects are making more and more use of state-of-the-art luminaire and lighting control technologies. There is one persuasive argument for building developers: the initially higher investment costs are usually amortised within three to five years.

2 Using daylight

Individual sense of well-being thanks to automation

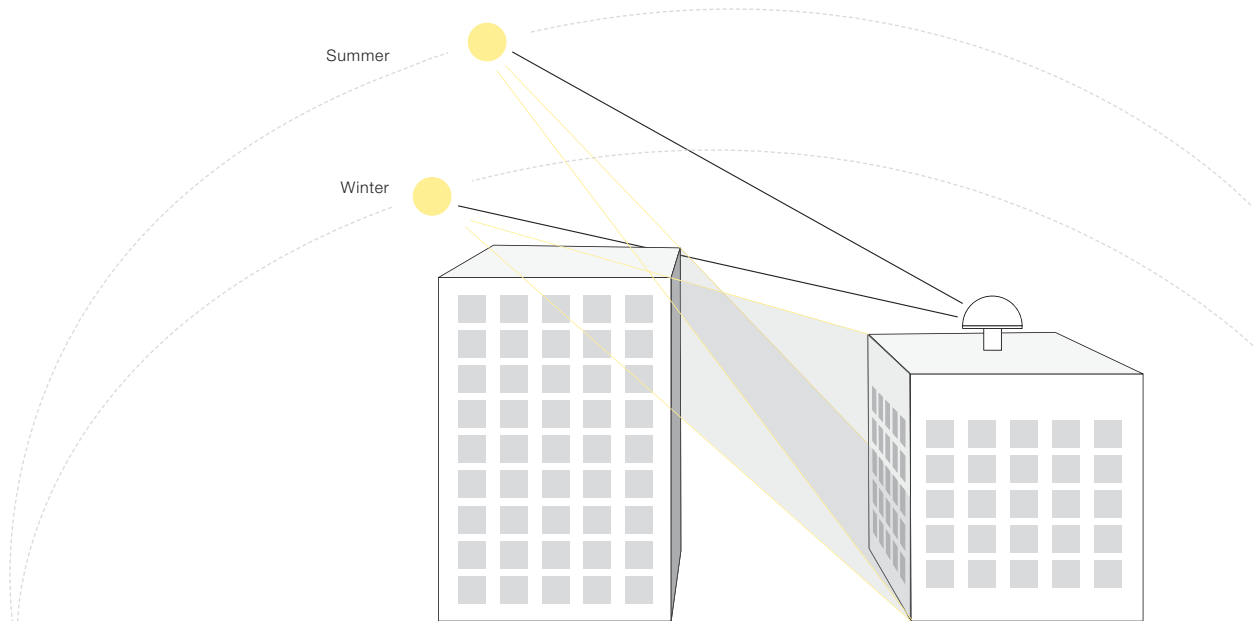


The wealth of ideas provided by nature

The sun has a particular relationship to every location on Earth. A LUXMATE daylight-based system takes sunlight's various angles of incidence and intensities into account as well as changes in sunlight over the course of a day or a year.

Keeping up with nature's complex transitions and changes poses a variety of complex challenges for a daylight-based system – from monitoring relevant lighting conditions through to mimicking natural changes in daylight and allowing user intervention at any time. A LUXMATE system embodies more than 20 years of lighting management experience. This cumulative knowledge and expertise is reflected in the control units, control modules and software.

Just a few LUXMATE highlights: the system responds cautiously in a non-disruptive manner. The automated system dims and switches artificial lighting in a manner that minimises and prevents any jarring effects. Users can employ a variety of control units to override the automatic control system and control luminaires and blinds manually. The specific geographical location of the installation, together with its range of sun positions, are stored in every installation in order to ensure optimal light sensor accuracy. The natural lighting conditions for every room can be determined precisely from all this information; the next step is to individually calculate the settings for each luminaire and set of blinds and control them very accurately at all times.



Artificial intelligence

Perfectly coordinated automation and management software make it possible to define and deliver optimal settings for lighting and blinds in every room, even if rooms are partially shaded by adjacent buildings.

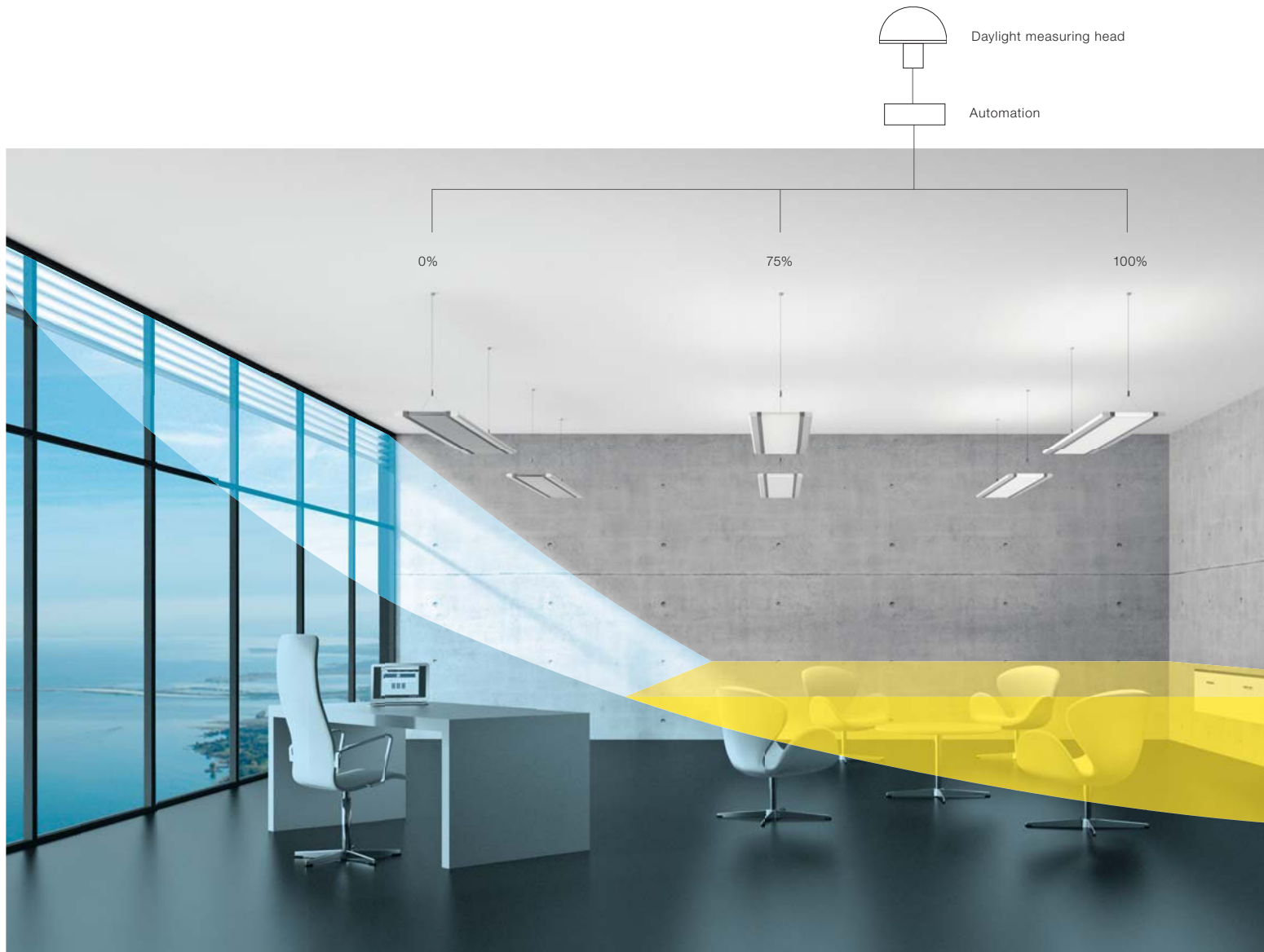
Intelligent daylight-based control performs five tasks: it optimises glare protection and produces as much daylight as possible in the interior by controlling the way that the light and blinds interact. The slats of blinds can even be controlled precisely depending on the position of the sun where suitable blinds are fitted. Excessive direct sunlight on large-scale glazed panels can trigger a greenhouse effect. As a result, it costs more to keep the building cool. Consistently controlled blinds can help overcome this problem. Whether or not people feel at ease in a room depends not least on whether contact with the outdoor environment is preserved. Workplace legislation and standards therefore demand an unobstructed view of external surroundings as well as control of glare caused by daylight. LUXMATE solves these apparently conflicting requirements. Blinds are only lowered sufficiently to achieve the desired sunscreening. At the same time, the rotatable slats of the blinds are positioned to ensure the best possible visual link to the outside. One special feature is the fact that shadows cast by adjacent buildings, for instance, are detected and the blinds open, thus giving an unimpeded view out of the building. LUXMATE cleverly controls all the blinds so as not to spoil the attractive impression that a uniform façade look makes.

Daylight used in five intelligent ways:

- 1 Makes optimum use of sunlight
- 2 Prevents distracting glare
- 3 Preserves a visual link with outdoors
- 4 Adjusts the room climate in winter and summer alike
- 5 Makes sure façades look attractive

2 Using daylight

Professional planning starts with the right sensor technology



Daylight measuring head and Look Out sensors

If incident light is captured centrally on the roof of a building or on the actual window frontage, lighting control systems work more accurately and involve less effort than constant-light sensors. Depending on the position of the luminaire, the lighting control system adds sufficient artificial lighting to achieve the desired lighting level.

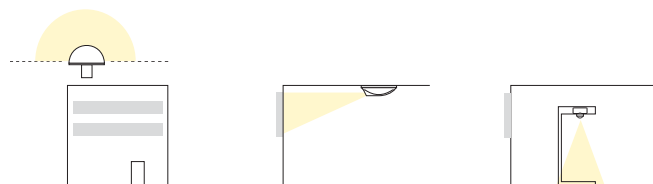
- Incident daylight
- Desired lighting level: constantly 500 lux



The high level of intelligence built into LUXMATE systems is based on accurately measuring the amount of available daylight. Installed outside the building, daylight measuring heads developed by Zumtobel that have proven themselves thousands of times take a panoramic lighting snapshot. Eight photocells record the position of the sun as well as direct and indirect light components once every second. The geographical location of the installation and its range of sun positions are stored in every installation. All this information is used to accurately determine the natural lighting conditions in a particular room.

Zumtobel recommends its Look Out sensor for relatively simple systems. This indoor sensor measures incident light in the immediate vicinity of a window. The system is therefore unaffected by reflections and reflected glare. Another benefit: it is really easy to combine this sensor with the daylight measuring head.

Look Down sensors are often marketed as standard components for daylight integration. Nevertheless, they often cause problems in practical use. Changing surfaces and luminance levels may distort the computed control value. Direct incident light from free-standing luminaires, or reflections on reflective surfaces such as window sills made of metal also interfere with control. In addition, Look Down sensors are only approved for standard heights because measured values decrease with increasing height. The use of a Look Down sensor is therefore only recommended in the case of movable luminaires and low detection heights such as free-standing luminaires, for instance.



Different systems – a direct comparison

	Daylight measuring head	Look Out sensor	Look Down sensor
Accuracy of measurement results	++	+	-
Susceptibility to lighting effects	++	+	-
Commissioning expense	++	+	+
Design and room vista	++	+	+
Restrictions with regard to installation	++	+	+
Constancy of illumination	++	+	-

3 Changing colour temperatures

So that people feel good and objects are shown to full effect

Taking nature as a model. Nature has shown us how light influences our mood by colour, intensity and direction. Even subtle changes in white tones suffice to provide stimulation or relaxation. This biological effect of light and the associated possibility of stabilising and synchronising the human body clock is now being factored into design concepts more and more. Light is therefore more than just a precondition for seeing properly; light is becoming a health factor, especially in situations where people are looking to rest and relax. This also applies in all areas where success depends on performance. Effective use of daylight is at the heart of biologically effective lighting concepts. If such light is not available naturally, intelligently controlled artificial lighting takes over as many of its tasks as possible. Predefined timelines stabilise people's inner body clock by creating the right light colour and appropriate lighting levels at all times of the day.

In the case of product display, there are further reasons for adjusting white tones. The right colour temperature at the right time cleverly presents the goods on offer in shops and retail areas to full effect. In galleries and museums, finely tuned colour temperatures and luminance levels enhance the perceived quality of works of art.

The range of luminaires and lighting control technologies featuring variable colour temperatures provided by Zumtobel include a variety of white tone options in the case of Selectable White, Balanced White solutions for mixing warm and cool white light sources as required, through to Tunable White, which allows to continuously change the colour temperature along the Planckian curve.



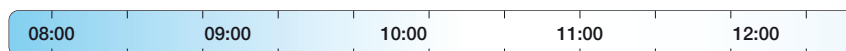
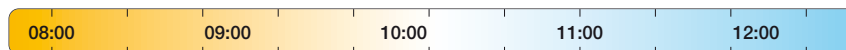
8:00 Warm white light for wallwashers and corridors gets the day off to an agreeable start



10:30 Artificial lighting is turned down as more daylight becomes available and the light colour is made more intermediate



12:00 Just as outdoors, the colour temperature

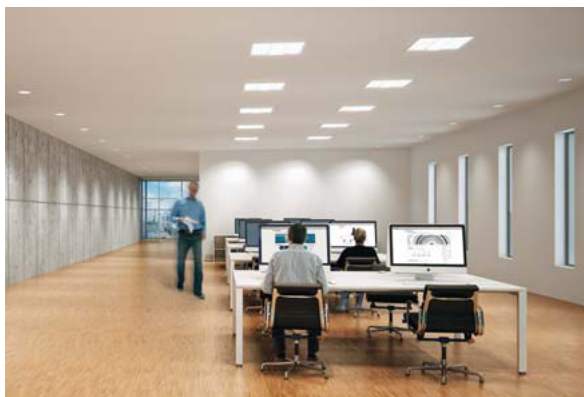


Changing colour temperatures

It is possible to stimulate people and improve their well-being and sleep quality by using timelines that run automatically or by individually selecting light components that are biologically effective.



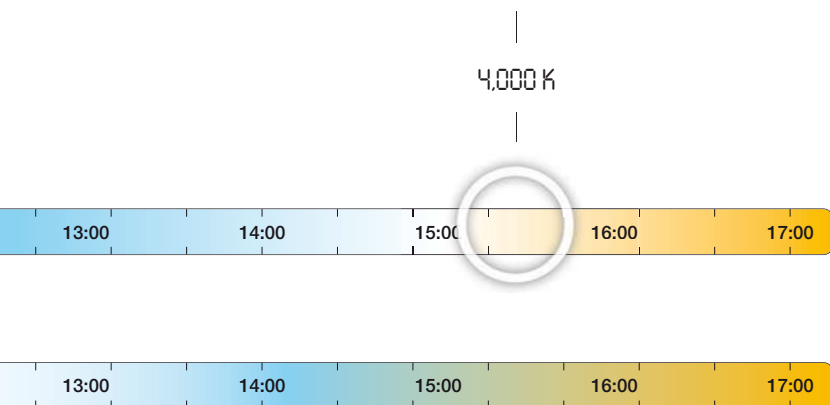
reaches its maximum level at midday



14:30 Intermediate white corridor and wall-mounted luminaires supplement the general lighting and compensate for low levels of daylight



17:00 When darkness falls, artificial lighting ensures a balanced ratio of warm white light components



These timelines show various ways of modifying colour temperature in a biologically effective manner: the upper timeline and the series of photos show variation that is synced with daylight. The lower timeline uses biologically effective light to speed up the inner body clock in the morning; this has a positive impact on sleep behaviour. The typical afternoon dip in energy levels is also compensated by an invigorating light component.

4 Integrating emergency lighting

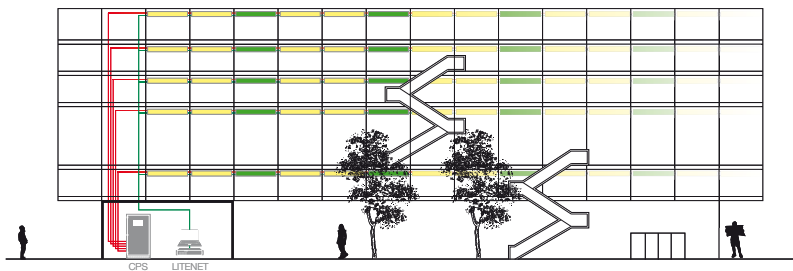
Complete solutions offer greater safety



Escape sign luminaire
ONLITE COMSIGN 150,
design EOOS

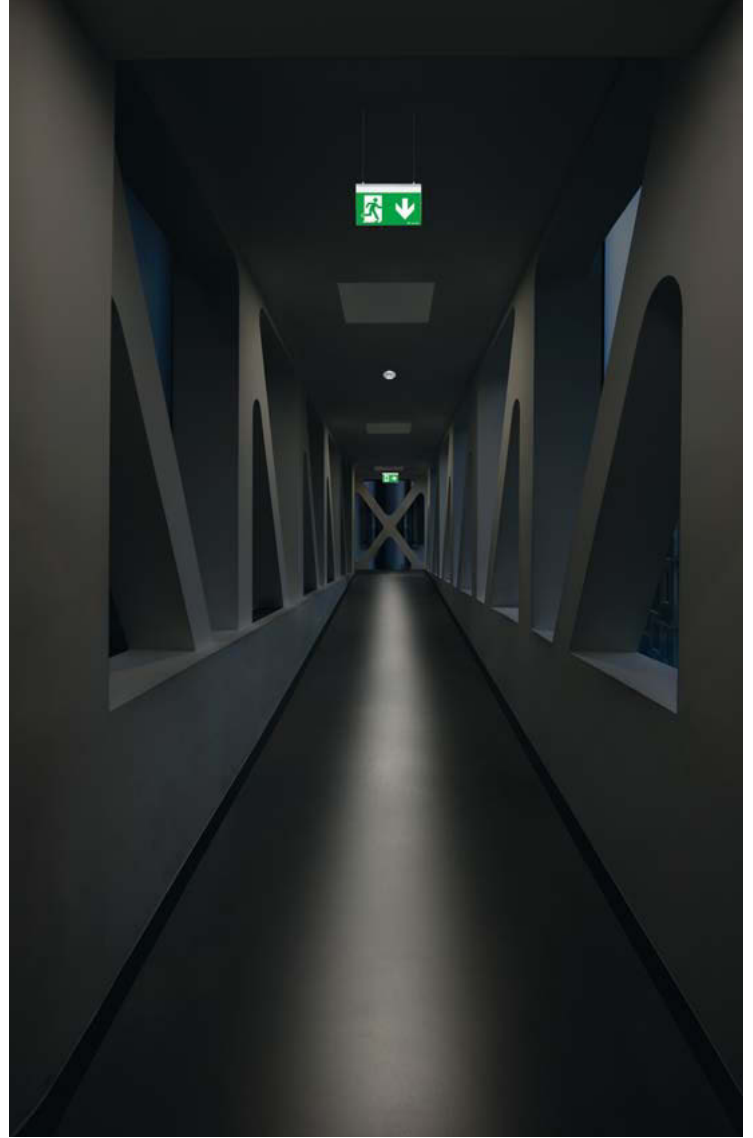
Light makes people feel safe. The night and darkness make people anxious – even when there is no danger. Light is even more important in stressful and emergency situations. Even a simple power failure can be enough to cause personal injury and damage to property; yet a minimum lighting level will suffice in an emergency to prevent panic and ensure that people can find their way out of risk areas safely and quickly.

LUXMATE LITENET control systems, separate-battery and centrally powered ONLITE luminaires and emergency lighting systems together form a dependable team. The lighting management system monitors the emergency lighting installations round the clock, and all the necessary tests are performed automatically at regular intervals. Besides dedicated emergency luminaires, luminaires in the general lighting system can be integrated into emergency lighting. This reduction in the number of luminaires also keeps costs down and produces an uncluttered ceiling look. The emergency lighting and the control system use the same DALI circuit, thus obviating the need to install additional bus lines.



A perfect combination: LUXMATE LITENET and the central ONLITE supply system use the same DALI circuit to ensure trouble-free communication.

- Luminares for general lighting
- Emergency luminaires as part of general lighting



Safety is a basic human need and so is light. Where an integrated solution is used, the emergency lighting components remain unobtrusive during normal operation, revealing their true capabilities only in the event of testing or an emergency.

LUXMATE lighting management

System overview

The LUXMATE product range offers the right system for projects of any size and to meet almost any requirement. Overview of functions:

	BASIC DIMLITE	Z-BOX	EMOTION	LITENET PROFESSIONAL
Convenience				
Dimming, lighting scenes	•	•	•	•
CIRCLE control unit	•	•	•	•
CIRIA control unit				•
Web-browser facility				•
Touch panel			•	•
Glare protection using blinds control		•		•
Colour control			•	
Stepless colour temperature control	CIRCLE tune		•	•
Central lighting management functions			•	•
Integration of building management systems				•
Economic efficiency				
Daylight-based management using Look Out sensor	•		•	•
Daylight-based management using daylight measuring head				•
Presence detection	•		•	•
Time-based management		•	•	•
Safety				
Emergency lighting integration				•
Project size				
Luminaires	≤ 200		≤ 128	≤ 10,000

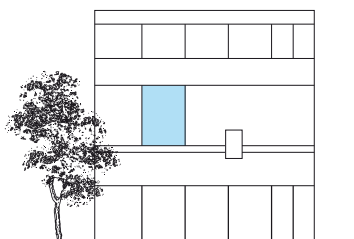
Lighting management for individual rooms

Plug & Play system for hotel rooms

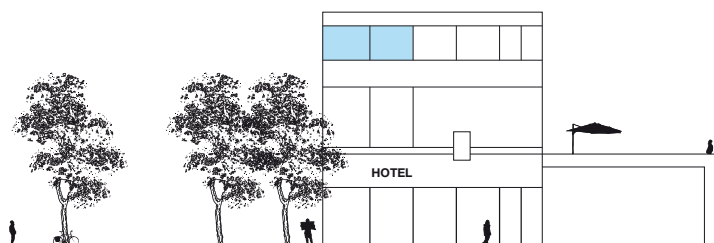
Lighting management for several rooms

High-end room management system with lighting and blinds control

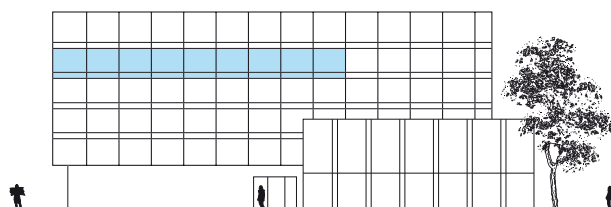
Dynamic lighting scenarios for external façades



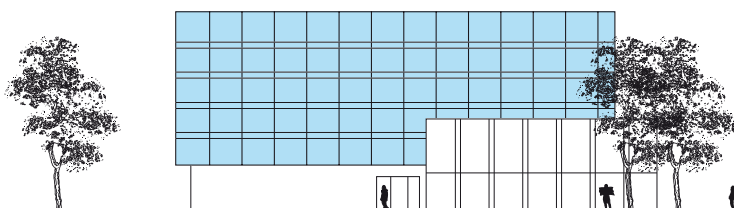
LUXMATE BASIC/DIMLITE
The ideal entry-level lighting management system. Requires no expensive commissioning. Installation is child's play and done in next to no time.



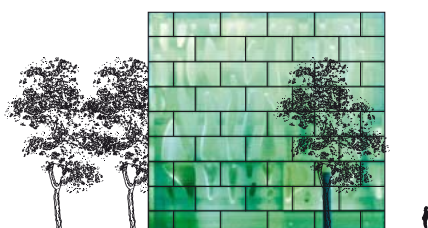
ZBOX
The compact solution for hotel rooms and patients' rooms. A well thought-out Plug & Play solution.



LUXMATE EMOTION
One touch panel, many functions. This product's particular strengths include dynamic colour control and intuitive operation.



LUXMATE LITENET / PROFESSIONAL
Building-wide lighting management for professional applications – with daylight and emergency lighting integration.



DMX LIGHTING MANAGEMENT AND MEDIA CONTROL
Dynamic façade lighting and creative media control based on DMX protocol or video control capability.

LUXMATE lighting management

At your side throughout every phase of a project and construction

Not just light. More than just a control system. A superb lighting solution demands expertise in both these disciplines. For over 50 years Zumtobel has been developing innovative, individual lighting solutions that meet the very highest ergonomic, economic and environmental requirements and deliver added aesthetic value.

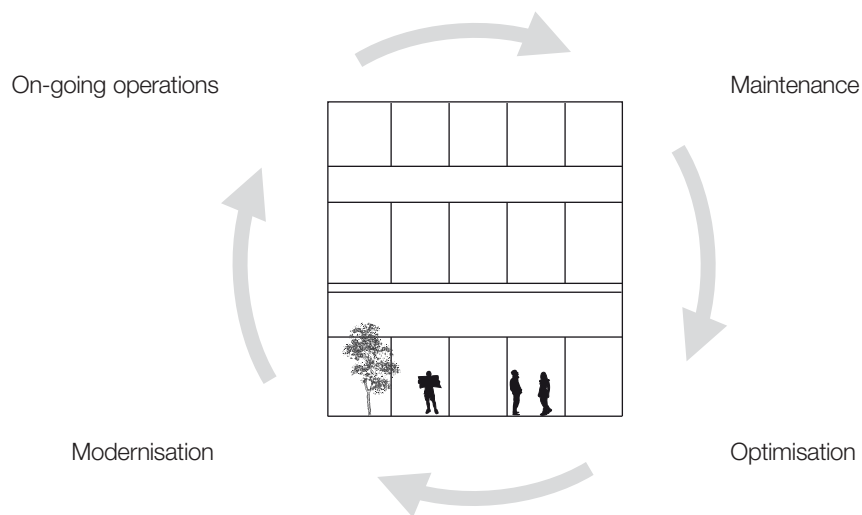
Not just a supplier. More than a consultant. Zumtobel is a partner that assists its customers through all the phases of a project and paves the way towards innovative lighting solutions by conducting scientific studies ahead of projects. Zumtobel has its own sales and service organisations in 23 countries and commercial agencies in 50 other countries.



This service offering is constantly being expanded in order to help Zumtobel's customers achieve their objectives quicker and more easily. Experts advise and assist customers during every phase of their project, from the request for proposals and acquisition through to completion of their building project. Trained, certified engineers are available to carry out commissioning. Engineers can provide professional advice on all aspects of daylight, artificial lighting, emergency lighting, system integration and lighting effects on-site at the customer's premises. Various maintenance packages with clearly defined service level agreements are offered throughout the entire life cycle of a system.

Services provided

The purpose of building management is to preserve the value and the functional capabilities of a building. Building management systems must therefore adapt themselves to changing uses and support continuous improvement initiatives. Regular maintenance and inspections preserve the required energy efficiency and are mandatory in the case of emergency lighting installations. Newly developed potential technical capabilities and savings can be exploited even in existing projects by adapting the lighting or operating concept for instance. Zumtobel service packages help implement such improvements without disruption in every phase of a building's life-cycle.



On-going operations

Day-to-day operations demand fast, effective solutions. Zumtobel offers every kind of dependable support ranging from telephone support and remote maintenance through to on-site callouts. Customers can be given intensive technical training to enable them to operate the system independently and more effectively.

Modernisation

What possibilities are there, and which measures are sensible? You will find Zumtobel a professional partner when it comes to issues involved in modernisation and lighting refurbishment as well as matters relating to lighting quality and energy efficiency. From design through to project support and commissioning.

Maintenance

Quality assurance for a lighting system involves regular, professional maintenance. This guarantees that a lighting solution will continue to operate reliably and efficiently for many years. This involves inspecting the lighting control system, together with all its modules and functions, and emergency lighting installations at specified intervals. Zumtobel's maintenance contracts make provision for various service level agreements and are backed up by a transparent package of services.

Optimisation

Circumstances and lighting conditions in a building change over the years. They create the need to take action in the context of a lighting solution. Various kinds of optimisation such as energy audits are offered to enable customers to continue achieving maximum energy savings and superior lighting quality.

LUXMATE lighting management

Application areas

Offices and communication

Lighting management caters superbly for individuals' lighting needs. Work that requires high levels of concentration and the increasing need for communication impose totally different requirements. Additional, biologically effective components of artificial lighting that complement daylight at appropriate times of day work in harmony with our internal body clock and are invigorating. Highly automated systems use time-based management, daylight-based control and presence detection to achieve maximum energy savings and flexibility in the event of relocation.

Page 34



Education and science

New teaching methods and media technologies are making flexible room usage and frequent lighting situation alterations a fact of everyday life. Convenient control units offer various lighting scenes at the press of a button. Daylight is stimulating and enhances people's sense of well-being and performance. Daylight-based control or presence detection cuts energy consumption while also improving lighting quality.

Page 36



Presentation and retail

Thanks to people's increasing awareness of energy efficiency, dimmable luminaires are conquering retail areas. Colour temperature and luminance can be varied in order to leverage the material effects of merchandise and architecture. Controlled lighting solutions are characterised by high levels of convenience, great flexibility and low maintenance costs because, for instance, the light spectrum can be perfectly tuned without time-consuming filter changes. Dynamic lighting concepts catch shoppers' attention and enhance attractiveness.

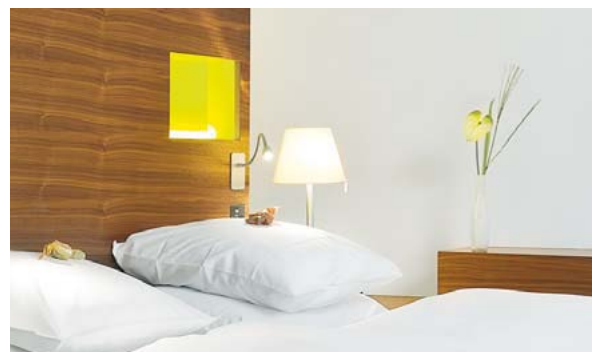
Page 38



Hotel and wellness

Intuitive control units are the top priority in hotel rooms. The guest's personal environment is individually designed by artificial lighting and the position of blinds. Dynamic lighting scenes that are flexibly defined through timelines or depending on the weather situation and controlled according to the time of day heighten guests' sense of well-being in restaurant and wellness areas. Exacting requirements are placed on emergency lighting systems.

Page 40





Art and culture

Lighting management delivers intelligent protection for exhibits that are sensitive to light: presence detection ensures sparing, gentle exposure to light. Lighting solutions with variable colour temperatures create luminance levels and light colours that are crucial to ensure proper perception. Switch-on and switch-off times are defined for specific times of the day. Blinds management and daylight sensors reconcile the conflicting needs of aspects such as architecture, the protection of exhibits, individual well-being and energy costs.

Page 44



Health and care

Hospitals and care facilities impose extremely exacting requirements when it comes to lighting management. Intuitive control options within easy reach are the key to winning user acceptance. Dynamic lighting sequences over the course of the day work in harmony with human circadian rhythms. Presence and daylight sensors, combined with the necessary emergency lighting, reconcile the needs for safety and energy efficiency.

Page 46



Industry and engineering

Investing in a lighting control system and efficient luminaires pays for itself quickly thanks to extended operating hours with shift working and daylighting. It also makes full allowance for the requisite flexibility. The shift from switchable-only discharge lamps to dimmable light sources is catered for by systems with daylight-based and presence-based control and reaps valuable potential energy savings.

Page 48



Façades and architecture

LED technology, used in conjunction with a lighting control system, is ushering in a new age for façade lighting. Buildings that are dynamically set centre stage convey information and make it possible to direct the viewer's gaze purposefully. From an environmental viewpoint, stray light at night is a hot issue. It can be avoided primarily by adopting sensible operating hours and concentrating on evening and morning hours when there is heavy public footfall.

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Light for offices and communication

VHV Group, Hanover | DE

The workplace of the future is already a reality at the head office of Hannoversche Lebensversicherung AG. This highly efficient building with triple glazing and thermally insulating façade elements uses geothermal probes, heat pumps and district heating to meet its considerably reduced energy requirements.

The future starts now

The client wanted a highly efficient office building that provided maximum flexibility and was ideally prepared to cope with a large number of anticipated alterations in room layouts. It was looking for a company that supported lighting management externally, took over facility management and performed maintenance.

Lighting control strategies

All the luminaires and blinds in the three-part building complex are controlled by a TCP/IP-based LITENET lighting management system. All settings and changes to the system can be made from a central location. This was achieved by integrating the system into a building-wide OPC visual display. Individually addressed DALI luminaires make it possible to respond flexibly to changes.

Available daylight is measured by a central daylight measuring head. Exterior blinds with a light guidance function are adjusted appropriately depending on the position of the sun. The required dimming level of each individual luminaire to ensure constant lighting levels is recalculated and set at one-minute intervals. Presence detectors reduce the operating hours of luminaires in line with staffing levels. Employees can use wireless light switches to adapt lighting scenes to suit their personal preferences completely independently of any wiring in the building.



Key data

- 8,000m² of office space divided up between three buildings
- 1,500 workstations
- 60% energy saving by using daylight-based management
- System support provided by trained building services specialists and Zumtobel

Central daylight-based control and blinds control | LUXMATE LITENET



**VHV Group, Hanover | DE**

Architects: BKSP Grabau Leiber Obermann & Partner, Hanover | DE

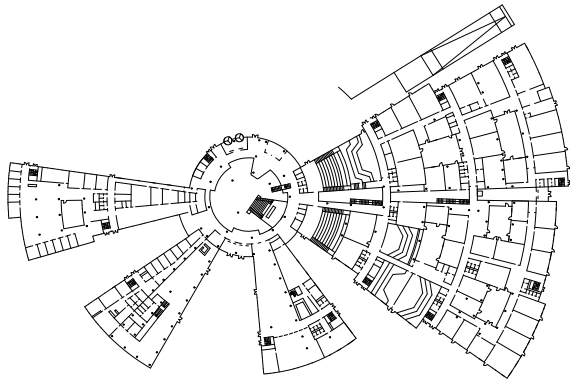
Lighting technology: Lumen³, Munich | DE

Electrical consultants: Taube + Goerz GmbH, Hanover | DE

Lighting solution: LUXMATE LITENET lighting management system, SLOTLIGHT II light line, SCUBA moisture-proof luminaire, PANOS downlight, PHAOS recessed luminaire, LINARIA and TECTON continuous-row systems, LIGHT FIELDS recessed luminaires

Light for education and science

Reykjavík University | IS



Reykjavík University | IS

Architects: Henning Larsen Architects, Copenhagen | DK
 ARKIS Architects, Reykjavík | IS
 Lighting design: VERKIS, Reykjavík | IS
 Electrical installations: Rafmiolum hf, Reykjavík | IS
 Lighting solution: LUXMATE LITENET lighting management system,
 ONLITE CENTRAL emergency lighting system, RU-SLIMLIGHT/Z-fourty-five special luminaire, PERLUCE surface-mounted luminaire, FEW louvre luminaire, VIVO spotlight



Viewed from above, Reykjavík University resembles the sun: the architects arranged the sections of the building around the central, circular hall like beams of light.

Complex requirements

All the various types of spaces such as lecture halls, seminar rooms, offices, libraries, corridors and the canteen had to be lit extremely energy efficiently and appropriately to the use in question. Because new sections were liable to be added to the building in a modular fashion, absolute flexibility was required when it came to system size and the range of functions.

Lighting control strategies

With its extensive function library, LUXMATE LITENET is ideally suitable for controlling the more than 27 different types of spaces in a usage-appropriate way. Particular attention has been paid to daylight integration: blinds control is precisely set up to take into account lighting conditions in northerly latitudes, and available daylight is only supplemented by luminaires when it is actually necessary. The requirements of more than 200 lecturers as far as the lighting situation in lecture rooms was concerned were just as disparate as the subjects they teach. In order to cater for all preferences, lighting situations can be set and saved by using a touch panel. For any subsequent seminar, the system identifies the lecturer thanks to his or her magnetic stripe card – and the room automatically delivers the preferred lighting scene.

The central-battery emergency lighting installation was networked with the lighting control system. The resulting reduced number of systems reduces expenditure on wiring and hardware. Building services specialists are automatically kept informed of the current system status and alerted to any faults. Modifications and maintenance tasks are performed automatically and service interventions can also be performed using remote maintenance as required.

Key data

- 27 different room types
- Over 200 lecturers
- Individually stored lighting scenes can be recalled using a magnetic stripe card
- Daylight-based control and blinds control are precisely tuned to suit lighting conditions in northerly latitudes

Central daylight-based control and blinds control | LUXMATE LITENET

Emergency lighting system | ONLITE CENTRAL





Light for presentation and retail
Nordsee restaurant, Kassel | DE



Supremely pleasant light 24 hours a day: guests perceive colour temperatures that mimic natural changes over the course of the day as being particularly inviting.



Nordsee restaurant, Kassel | DE

Electrical installations: Elektro-Anlagen Hübner GmbH, Nieste | DE
 Lighting solution: LUXMATE EMOTION lighting management system, PANOS INFINITY Tunable White downlight, SUPERSYSTEM LED and CARDAN LED recessed luminaires, LED light cove

Key data

- Changing colour temperature over the course of the day
- Operated and programmed by using EMOTION touch panel
- Lighting scenes at the touch of a button

The restaurant in Kassel was extensively renovated in order to give the slogan "Nordsee. The alternative" added impetus. In the course of interior refurbishment, the lighting too was completely modernised.

Appetising efficiency

The entire restaurant was converted to LED, and colour temperature in the dining area are inspired by the model that is provided by nature. The lighting control system was commissioned by Zumtobel Service, who also familiarised staff with the innovative lighting concept and showed them how to operate it.

Lighting control strategies

From a lighting viewpoint, morning starts by simply turning a central key-operated switch. The right light and high illuminance levels for restaurant prep work are immediately available. For diners, the day gets off to a start with warm colour temperatures reminiscent of the rising sun. At midday the restaurant is bathed in gleaming, cool light. In the evening, the EMOTION lighting control system paints a marine sunset scene: reddish hues invite diners to savour their evening meal at leisure. Recessed LED luminaires and LED light coves provide refreshing accent lighting regardless of the time of day. In kitchen areas, brightness levels rather than the light colour of the general lighting are changed to suit the best lighting situation for any particular task. The LUXMATE EMOTION lighting control system thus combines the benefits of LEDs, which include, among other advantages, low heat emission and therefore reduced expenditure on food refrigeration, with excellent hospitality. Operating convenience can also be taken for granted when using EMOTION. When the restaurant closes in the evening, turning the key-operated switch illuminates the restaurant in a red light which matches the firm's corporate design.

Multi-room control | LUXMATE EMOTION



Variable colour-temperature luminaire | PANOS INFINITY Tunable White



Light for hotel and wellness

Hotel Budersand Golf & Spa, Sylt | DE

This five-star hotel unites light and nature in a remarkable architectural setting. Nearly all the colours, materials and shapes of this ensemble of buildings with an adjacent golf course are reflected in the hotel's immediate environment and provide a harmonious link between each building and nature.

Fascinating light

The coastal landscapes of the North Frisian island of Sylt fascinate visitors with enthralling lighting scenes. This special daylight bestowed by nature served as an inspiration for the interior lighting in the two- and three-storey sections of the hotel that are linked by bridges. The intuitive way in which the lighting is operated invites and encourages guests to make full use of the varied range of lighting scenes that are on offer.

Lighting control strategies

Luxury means not having to worry about anything, not even the lighting. Guests who stay in the 79 hotel rooms and suites can enjoy various lighting scenes at the press of a button. CIRCLE multifunction switches are located in the entrance to the room, in the bathroom, near the desk and alongside the bed. The ZBOX controller delivers perfect lighting for doing hair or make-up, watching TV, reading or taking a bath. In public areas, the restaurant, the library and the SPA area, LUXMATE LITENET ensures perfect lighting. In order to adjust the artificial lighting to suit not only current lighting requirements but also the amount of daylight that is presently available, a central daylight sensor identifies the amount of light that is needed at a particular instant. All escape sign and emergency luminaires are powered by an ONLITE central-battery system in the event of an emergency. Automatic tests and inspections ensure that high safety standards are met.



Key data

- 5-star hotel on the North Sea coast
- 79 suites and hotel rooms
- 1,000 m² spa area
- Complete solution with convenient lighting scenes for hotel rooms, daylight-based control for publicly used areas and integrated emergency lighting
- Maintenance under the terms of a Zumtobel service contract

Central daylight-based control with single-room control | ZBOX, LUXMATE LITENET

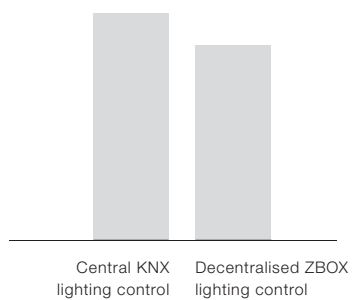
Emergency lighting system | ONLITE CENTRAL

**Hotel Budersand Golf & Spa, Sylt | DE**

Client: Südern GmbH, Darmstadt | DE
 Architect: dko Architekten, Patrik Dierks, Berlin | DE
 Interior design: Studio Jan Wichers, Hamburg | DE
 Lighting design: Hamburg Design, Harry Mayer, Hamburg | DE
 Lighting solution: LUXMATE LITENET lighting management system, ZBOX lighting control systems and CIRCLE control points, ONLITE central-battery system



Light for hotel and wellness
Hotel Belvoir, Rüşchlikon | CH



Cost comparison

Power consumption per hotel room drops by 10% on average when a ZBOX controller is used. Strikingly improved feel-good factor for guests, who can enjoy lighting scenes composed by experts at the press of a button.

What do you get when the client comes from a scientific, technical background, the interior designer likes to be provocative and the hotel operator is an experienced old hand? A hotel like the Belvoir. The hotel echoes the shape of a nearby glacier and offers magnificent views across Lake Zurich.

Technology is meant to help, not hinder

That is the yardstick by which the lighting control system is also judged. The client and the future hotel operator both assumed different roles several times during the planning phase: the role of guest in order to test user-friendliness, or the role of operator with the primary concern being low maintenance costs, energy savings and simple maintenance.

Lighting control strategies

ZBOX is a self-contained system that controls one hotel room and responds flexibly to requested changes. CIRCLE multifunction switches make it clear to guests immediately how to operate the system. Guests can set ready-made lighting scenes at the press of a button. The horizontal shutters are controlled by a central daylight measuring head but can nevertheless be raised or lowered manually. Automatically closed blinds prevent the build-up of heat when a room is unoccupied. Inserting a key card automatically opens the blinds and activates the "welcome" lighting scene. A morning, midday and evening scene is programmed for the restaurant; their brightness is easily adjusted by touching the iPod-like CIRIA user interface. The lighting control systems, emergency lighting system and emergency luminaires have been provided by a single supplier. The fewer interfaces there are, the easier and quicker it is to put a system into service.



Hotel Belvoir, Rüschlikon | CH

Client: Heinz P. Meier, Hotel Belvoir, Rüschlikon | CH
 Interior design: architektur & designbüro, Zurich | CH
 Electrical consultants: enerpeak salzmann ag, Dübendorf | CH
 Lighting design: Lichtkompetenz, Zurich | CH
 Lighting solution: LUXMATE PROFESSIONAL lighting management system, ZBOX lighting control systems and CIRCLE control points, ONDARIA circular luminaire, ONLITE central battery system, ONLITE escape sign and emergency luminaires

Plug & Play system for hotel rooms | ZBOX



Central daylight-based control and emergency lighting control | LUXMATE PROFESSIONAL, ONLITE CENTRAL



Light for art and culture

Städel Museum, Frankfurt am Main | DE



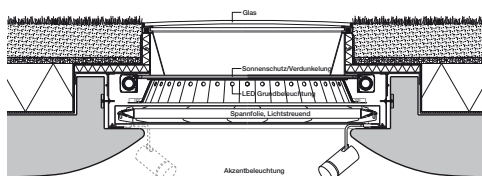
Although it is built underground, the new building is visible above the ground. People can walk over the slightly domed lawn of the Museum, which has a distinctive feature: 195 circular skylights that inject natural light into the subterranean exhibition area and are also used as LED artificial light sources. When excessive amounts of daylight enter the room, the lighting management system ensures that exhibits are protected and conserved. Movable roller blinds shut out daylight in four stages until a complete blackout is obtained.

Unfettered enjoyment of art

Demanding requirements when it came to lighting quality were accompanied by requests for flexibly groupable lighting and blinds that were invisibly integrated into the architecture. The combination of an intelligent control system with cutting-edge LED technology has produced a totally individual, adaptable lighting concept.

Lighting control strategies

Partitions divide the Garden Hall up into smaller exhibition spaces. The lighting control system assigns corresponding skylights to the spaces this creates, thus allowing lighting conditions to be adjusted selectively. The LED lighting fitted in the skylights is controlled depending on the amount of available daylight and on the basis of the required lighting or maximum lighting levels that are compatible with the items on display. This is achieved by a daylight measuring head that measures prevailing outdoor brightness and relays relevant data to the lighting management system. This data is also used to set the adjustable shading system in the skylights to a pre-set position depending on the position of the sun and outdoor brightness.



Fitted with LED lighting and roller blinds, LUXMATE-controlled skylights supply the subterranean exhibition spaces with just the right amount of daylight and artificial lighting.



Städel Museum, Frankfurt am Main | DE

Architect: schneider+schumacher, Frankfurt am Main | DE
 Lighting design: Licht Kunst Licht AG, Bonn/Berlin | DE
 Electrical consultants: Delta-Tech, Weiterstadt | DE
 Electrical installations: Imtech, Rüsselsheim | DE
 Lighting solution for new building: LUXMATE PROFESSIONAL
 lighting management system, special LED solution for skylights
 with ARCOS LED spotlight

Key data

- New building with approximately 3,000 m² of exhibition space
- Room height 8.20 m
- 195 skylights with diameters ranging from 1.5 to 2.5 m
- Daylight-based control of artificial lighting and blinds

Central daylight-based control and blinds control | LUXMATE PROFESSIONAL



Light for health and care

Gmunden Regional Hospital | AT

The project to extend and refurbish this hospital exemplifies new ways of thinking in healthcare facilities. The aim is to ensure high-quality medical supply that is appropriate to needs and make the patients' stay as pleasant as possible – while not overlooking strict economic efficiency targets.

Feeling good and cutting costs

The new lighting was also expected to deliver both high quality and efficiency. The client wanted an extremely efficient building that provided perfect visual comfort and was easy to maintain. Safety in the building and easy orientation were the main priorities.

Lighting control strategies

The entire building solution with control systems for artificial lighting, daylight and emergency lighting has a single interface: a TCP/IP-based LUXMATE LITENET lighting management system. This software allows all settings and changes to be made from a central location. Daylight is measured by a central daylight measuring head and blinds are adjusted depending on the position of the sun. Presence detectors in corridors, stairwells and parking areas make sure that light is only switched on when it is actually needed. All this made it possible to cut energy consumption by up to 60 percent. In contrast, there is an abundance of lighting comfort. Ideal lighting scenes have been defined for all areas and applications. CIRCLE multifunction switches use self-explanatory symbols to ensure that operation is patient-friendly. Individually addressable DALI luminaires make it possible to respond flexibly to changes. The centrally powered emergency lighting system is also monitored by DALI – a big plus in terms of safety and lower maintenance costs.



Gmunden Regional Hospital | AT

Architecture and lighting technology: Fasch & Fuchs ZT GmbH, Vienna | AT
Electrical consultants: TB Wanger & Partner ZT GmbH, Linz | AT
Lighting solution: LUXMATE LITENET lighting management system, ONLITE central-battery system, PURELINE II single-bed luminaire, CONBOARD medical supply unit, PANOS downlight, TECTON continuous-row system, SLOTLIGHT light line





Key data

- General hospital with 7 specialist departments with inpatient beds, 2 institutes and an acute geriatric day clinic
- 3,500 luminaires and 500 blinds
- 60% energy saving thanks to lighting refurbishment with intelligent lighting control system

Central daylight-based control and blinds control | LUXMATE LITENET



Emergency lighting system | ONLITE CENTRAL



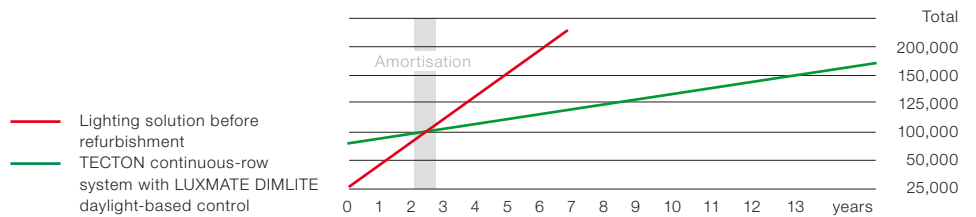
Light for industry and engineering
Ferag AG conveyor and processing systems, Hinwil | CH



Ferag AG conveyor and processing systems, Hinwil | CH

Electrical installations: Ferag AG, Hinwil | CH

Lighting solution: LUXMATE DIMLITE lighting management system with ED-EYE Look Out sensors, TECTON continuous-row system



The lighting solution's payback period

A comparison of overall costs shows that investing in daylight-based lighting refurbishment pays for itself within 2 to 3 years thanks to reduced operating costs.



Conveyor and processing systems for the print media industry are manufactured, cabled and tested in Ferag AG's machine shop. The lighting in the machine shop was timeworn until just a few months ago. Insufficient light, frequent lamp failures and awkward maintenance often disrupted work and incurred considerable costs.

Upgrading the company's building

The chief argument in favour of lighting refurbishment was the need for optimum lighting conditions. The procurement and maintenance costs as well as the energy consumption of the old luminaires were also no longer acceptable. The new solution was consistent with the company's basic principles of using resources carefully and being committed to sustainability.

Lighting control strategies

The various task areas in the machine shop and a desire to integrate daylight provided the starting point for lighting design work. There are CNC machines with displays in the front part of the shop, and mechanical plant components are assembled elsewhere. The TECTON continuous-row system uses various optics to cater for the needs of the various visual tasks. A DIMLITE lighting control unit compensates for changing amounts of daylight over the course of the day. Look Out sensors facing the glazed frontage measure incoming natural light. If daylight fails to provide the predefined brightness, luminaires are dimmed up to an appropriate level. This improves lighting comfort and minimises energy consumption: lighting refurbishment will pay for itself within about two years.

Key data

- Lighting refurbishment in machine shop, floor area of 165 × 16 m
- Energy consumption before refurbishment: 72.76 kWh/m²a
Energy consumption after refurbishment: 5.96 kWh/m²a
- Just three components for daylight-based control: dimmable luminaires, light sensors and LUXMATE DIMLITE lighting control units

Individual-room control | LUXMATE DIMLITE



Light for industry and engineering

Engel Werke St. Valentin, Schwertberg and Dietach | AT

This family-owned business is the world's biggest manufacturer of injection moulding machines and is committed to using resources responsibly. In the wake of problems with its existing high-intensity discharge lamps, the company devised a concept for a perfect lighting solution that was to be rolled out across all its sites. Zumtobel's ecoCALC calculation program was used to work up different versions and compare them with each other beforehand.

Better light. Lower energy consumption.

The objectives of the project to refurbish the lighting in the production bays focused on two key issues: saving energy, and providing excellent lighting quality to assist fault-free work.

Lighting control strategies

Latest-generation high-bay luminaires replaced the ageing high-bay reflector luminaires. Their dimmability was indispensable in order for the LUXMATE LITENET lighting control system to exploit free daylight to the full by providing only as much artificial lighting as needed in order to maintain a constant lighting level. The central software control centre reveals its full capabilities in the St. Valentin plant: the lighting in all 45 areas of the plant is controlled minute by minute based on predefined time intervals. Lighting scenes are adapted to suit individual needs via all the computer workstations using web-based LITENET incontrol operating software with appropriate user management. Graphical visualisation with CAD bay layout drawings gives building services staff a complete overview and lamp failures are pinpointed immediately – with interfaces to other building services systems. After commissioning by Zumtobel and a specially tailored training session, building services specialists at Engel have now assumed responsibility for operating the LITENET system.



Key data

- 2,800 controlled luminaires in total
- Annual energy cost savings of € 527,900
- Annual maintenance cost savings of € 20,994

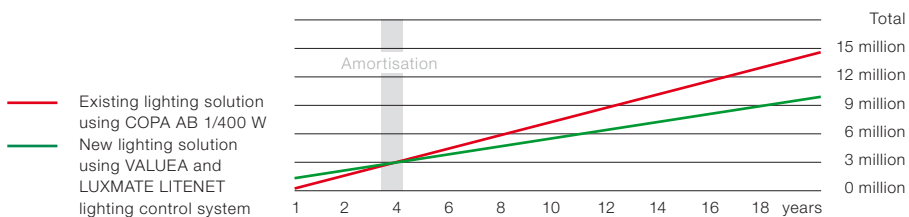
Central daylight-based control |
LUXMATE PROFESSIONAL





Engel Werke St. Valentin, Schwertberg and Dietach | AT

Electrical installations: G. Klampfer Elektroanlagen GmbH, Leonding | AT
 Lighting solutions: LUXMATE LITENET lighting management system with automation processor, server, external daylight sensor, gateway and software, VALUEA high-bay luminaire on TECTON trunking



The lighting solution's payback period

A comparison of overall costs shows that investing in daylight-based lighting pays for itself within 3.85 years thanks to huge savings in maintenance times.

Light for façades and architecture
Gaislachkoglbahn, Sölden | AT



Key data

- Individually programmable colour set-ups and transitions
- Desired stage setting can be recalled at the press of a button
- Can be combined with automatic timers

DMX control | BUTLER XT



Media luminaire | HEDERA RGB





Lighting scenarios for façades are a particularly striking form of image advertising. A lighting control system and the dynamism it provides brings an extra dimension to architecture.

Not a shrinking violet

The two cable cars were constructed on the basis of plans drawn up by the Innsbruck-based Johann Obermoser architects' studio. Impressive façade lighting was designed to allow the light and airy steel frame wrapped in a transparent synthetic skin to reveal the full force of its aesthetic appeal.

Lighting control strategies

Zumtobel's HEDERA LED media luminaire which has four red, green and blue lighting points respectively was integrated into the façade in two continuous lines. A DMX system controls each individual lighting point separately. A total of seven, mostly dynamic, lighting sceneries were devised in close collaboration with Zumtobel lighting designers, themed on the idea of immersing the structures in the colours of the Ötztal Tourism Association. Sequences composed by Zumtobel Service on a PC were loaded in the controller in situ. Light shows are manually activated via a touch panel and a time-based control function switches them off late at night. There are boundless possibilities for future wish lists regarding colour schemes and dynamic changes. New colour sequences created on a PC can be loaded quickly on site.

The luminaires, control system, design, planning and implementation of the lighting scenario have all been provided by a single supplier: Gaislachkoglbahn stations illuminated in exciting colours are a new magnet for visitors to the Ötztal area.



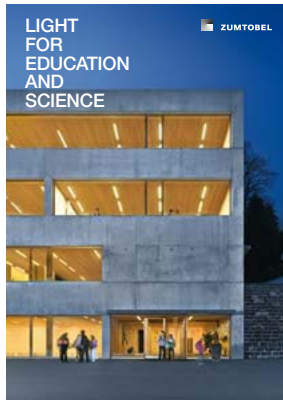
Gaislachkoglbahn, Sölden | AT

Architect: obermoser arch-omo zt gmbh, Innsbruck | AT
Electrical consultants: Falkner & Rimi, Sölden | AT

Lighting solution: HEDERA media luminaire with DMX controller for the façade; PERLUCE moisture-proof diffuser luminaire, KAVA LED wall-mounted luminaire, COPA high-bay luminaire, SLOTLIGHT II light line, BEGA 6876 wall-mounted luminaire



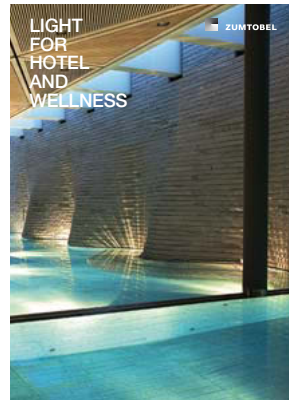
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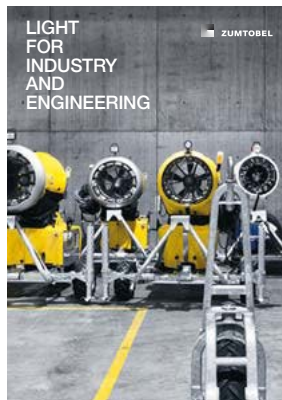
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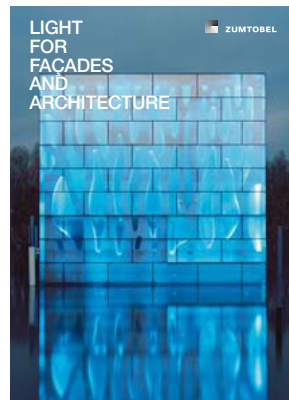
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Zumtobel is the internationally leading supplier of integral lighting solutions for professional interior and exterior lighting applications.

- Offices and Communication
- Education and Science
- Presentation and Retail
- Hotel and Wellness
- Art and Culture
- Health and Care
- Industry and Engineering
- Façades and Architecture

We provide unique customer benefits by integrating technology, design, emotion and energy efficiency. Under the Humanergy Balance concept, we combine the best possible ergonomic lighting quality for an individual's well-being with the responsible use of energy resources. The company's own sales organisations in twenty countries, as well as commercial agencies in fifty other countries, form an international network of experts and design partners providing professional lighting consulting, design assistance and comprehensive services.

Lighting and sustainability

In line with our corporate philosophy "We want to use light to create worlds of experience, make work easier and improve communications and safety while remaining fully aware of our responsibility to the environment", Zumtobel offers energy-efficient high-quality products, while at the same time making sure that our production processes based on the considerate use of resources are environmentally compatible.

zumtobel.com/sustainability



Top quality – with a five-year guarantee.

As a globally leading luminaire manufacturer, Zumtobel provides a five-year guarantee for its complete product range.

zumtobel.com/guarantee

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 Technical data was correct at time of going to press.

We reserve the right to make technical changes without notice. Please contact your local sales office for further information. For the sake of the environment: Luxo Light is chlorine-free paper from sustainably managed forests and certified sources.





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Surface-mounted and pendant luminaires



Free-standing and wall-mounted luminaires

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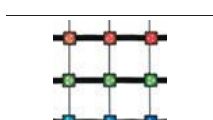
High-bay luminaires and floodlight reflector systems



Luminaires with extra protection

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Lighting management system



Emergency lighting



Medical supply systems

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