

InCity

Lighting management systems
build bridges to the future





“Pleasant outdoor lighting is essential for urban spaces, where well-being is closely linked to issues of guidance, orientation and safety. Tailored light scenarios facilitate necessary changes in the spatial environment. Data communication enables both the movements of the users and time and climatic factors to be integrated into the overall controls concept.”



Dieter Bartenbach, Innsbruck | AT
Process-based light and
spatial environment consulting

Shape the future

InCity opens up a wealth of opportunities

The intelligent way to take responsibility

Cities and communities are in a state of constant change – a state dependent on the time of day, the number of people present and the volume of traffic passing through the streets or squares. Urban life is also shaped by the weather, while special occasions or events can change the picture completely. Nevertheless, local authorities have the responsibility to ensure the right light in public areas at all times, in public areas. This is because good illumination provides a feeling of safety and helps make a location inviting and attractive for local residents and visitors alike.

Yet how can this desire for more convenience and safety be aligned with increasing demands for cost savings and sustainability? What happens when the budget is limited and daily maintenance takes up a sizeable chunk of the financial resources? Indeed, a quick look to the future reveals even more challenges. New roads and squares will be built and systems in existing streets should somehow be incorporated into a comprehensive solution. At the same time, the gradual shift towards the creation of Smart Cities is gathering increasing momentum.

The InCity lighting management system has been developed specifically to meet the daily challenges of public outdoor lighting by combining a raft of intelligent functions. InCity blends the highest standards of safety and comfort with significant cost savings in terms of energy and maintenance – along with the option to achieve genuine added value through modern data management and open-system architecture.

The shining example of Copenhagen

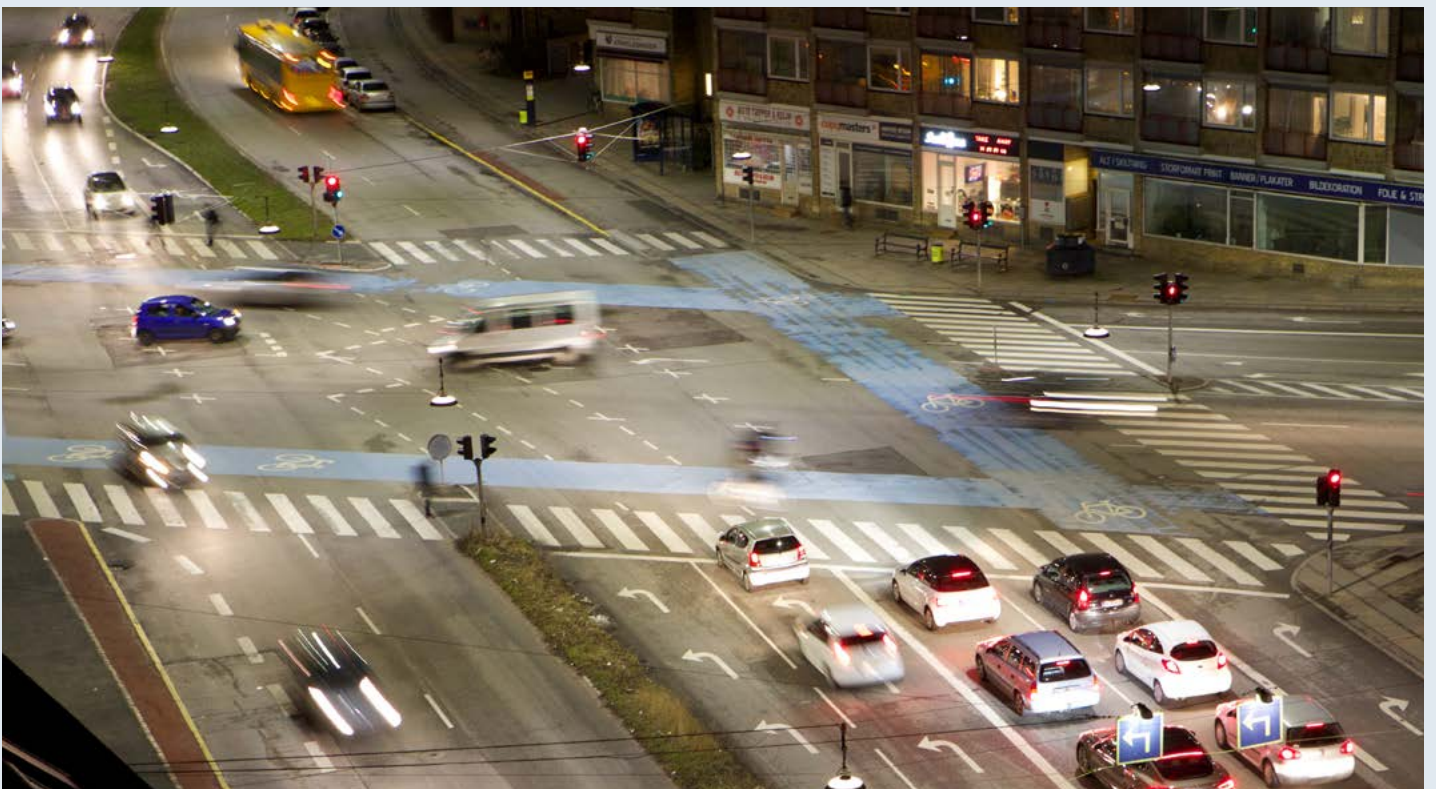
The Danish capital is aiming to become the “first climate-neutral city in the world” by 2025. Copenhagen's streets and squares are already efficiently illuminated with an 20,000 LED light points and an intelligent lighting management system from the Zumtobel Group. Indeed, thanks to a considerable reduction in energy consumption, the city was officially classified as a “Green City” in 2014.

The functional intelligence of the system helps deliver further benefits. Adjustments can be made quickly and easily, while faults are displayed immediately – meaning that workers no longer have to spend valuable time trying to find the cause of the problem. The recording of precise consumption data is used to continuously optimise the system.



"We have developed a modern, energy-saving lighting concept for Copenhagen that enhances both safety and quality of life."

Michael Ferm, Malmö | SE
Head of Outdoor Public Lighting
at the Zumtobel Group



Hand in hand

People and places benefit from InCity

Finding the right balance is crucial

Artificial lighting influences the natural rhythm and sleep behaviour of human beings. Even nature is sensitive when there is too much or too little light. InCity utilises the controls intelligence of a modern lighting management system, regulating the lighting intensity of exterior luminaires to precisely reflect the particular situation - at just the right time and in just the right place. Higher light levels during rush hour provide improved safety, while reducing the illumination in residential areas at night helps save energy, limit light pollution and support a more restful sleep. Adapting the lighting solution to suit specific usage practices also makes sense in terms of the changing seasons. For example, many public places remain busy until late into the night during the summer months. Motion sensors make it possible to react automatically

to different levels of traffic. If roads are rebuilt or new routes are developed, simple programming means that InCity can adapt quickly to these changing conditions.

Key savings in terms of energy and maintenance

Significant reductions in energy and maintenance costs show the clear financial advances of a dimmable and intelligently controlled lighting system, with potential savings of up to 80 per cent when compared to a conventional fixed solution. The use of motion sensors means that light is only provided when and where it is really needed. Systems with integrated time control respond to defined time intervals or the astronomical clock. The resulting reduction in operating periods also extends the service life of the luminaire components, which in turn lowers maintenance costs.

Non-dimmable lighting without controls

100%

Dimmable lighting with programmable ballasts

80%

20%

Dimmable lighting with local controls

60%

30%

10%

Dimmable lighting with central lighting management

20%

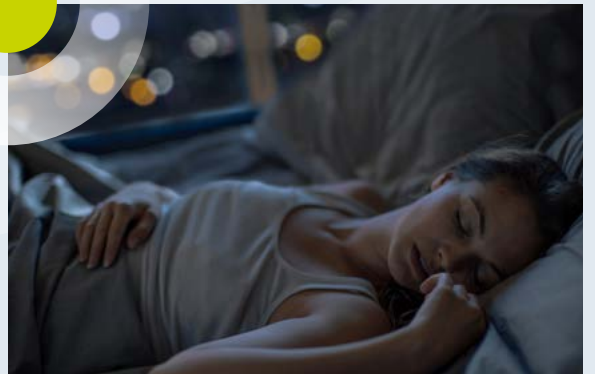
50%

30%

○ Energy and maintenance costs

● Energy consumption savings

● Maintenance savings



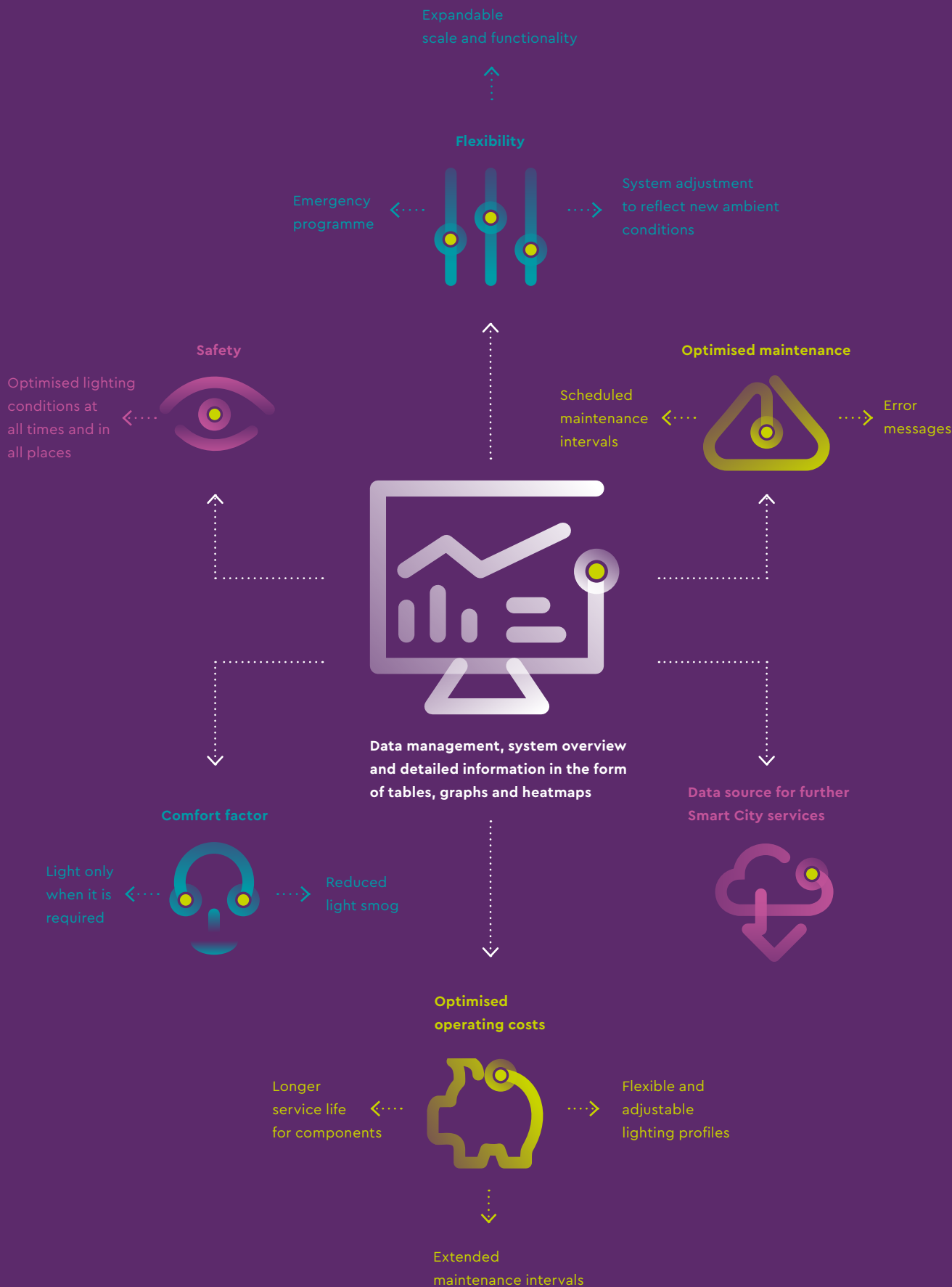
Humans need darkness at night for deep and restful sleep.



Increasing light levels during the rush hour supports improved road safety.



Motion sensors allow the operating times of a lighting system to be reduced to reflect the actual usage periods.



Create real added value

Systematic intelligence with InCity

The latest information at all times

Effective management requires detailed information. That is why InCity not only provides permanent monitoring and reporting, but also instantly evaluates all the data harvested from the system. This information can be accessed online at any time and from any location, while status reports make it easy to plan and improve service schedules. Error messages can also be automatically sent to specific individuals to facilitate an immediate response in sensitive applications.

Valuable data

An InCity database knows the history of each luminaire, which helps to identify additional ways of achieving further optimisation. Once the actual lighting needs have been identified, illumination levels can be adjusted to increase safety and reduce energy consumption. Heatmaps based on real street plans clearly demonstrate the peak times for road usage, paving the way for concrete measures that limit traffic congestion and improve quality of life for residents.

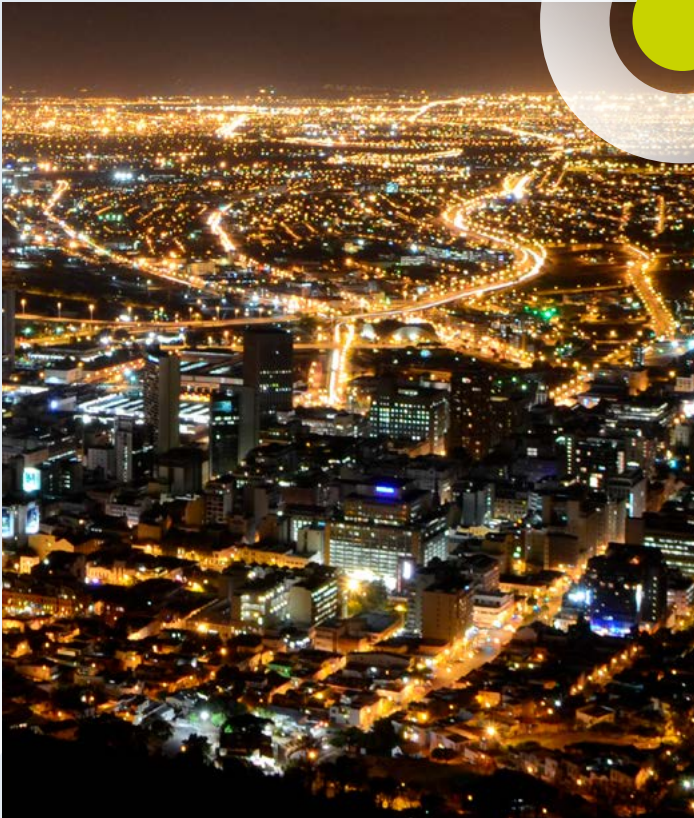
"A lighting system delivers more than just light. Intelligent lighting is the key to Smart Cities, with an increasing number of applications like parking systems connected to light."

A portrait of Kim Brostrøm, a middle-aged man with grey hair, wearing a dark suit jacket over a light-colored shirt. He is looking directly at the camera with a neutral expression. The portrait is set against a background of overlapping circles in shades of blue and purple.

Kim Brostrøm, Copenhagen | DK
Director of Technology at the Danish
Outdoor Lighting Lab (DOLL)

Step by step

InCity lights the way to the future

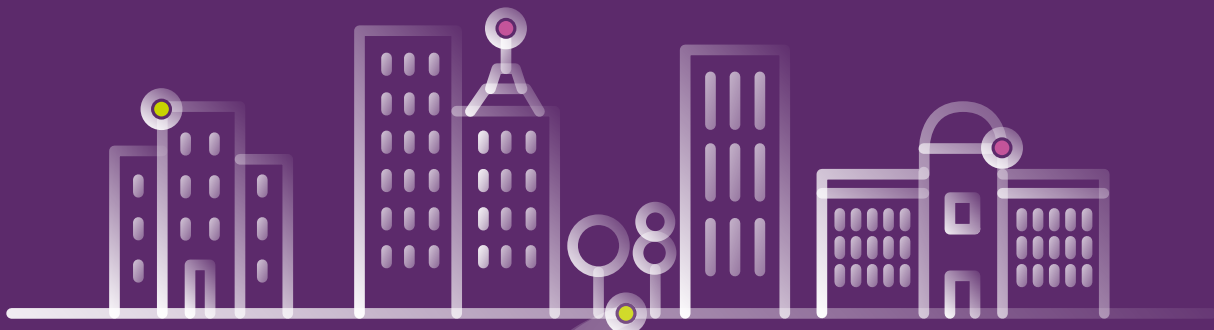


The InCity outdoor lighting management system grows with a city and its possibilities.

A management system with potential

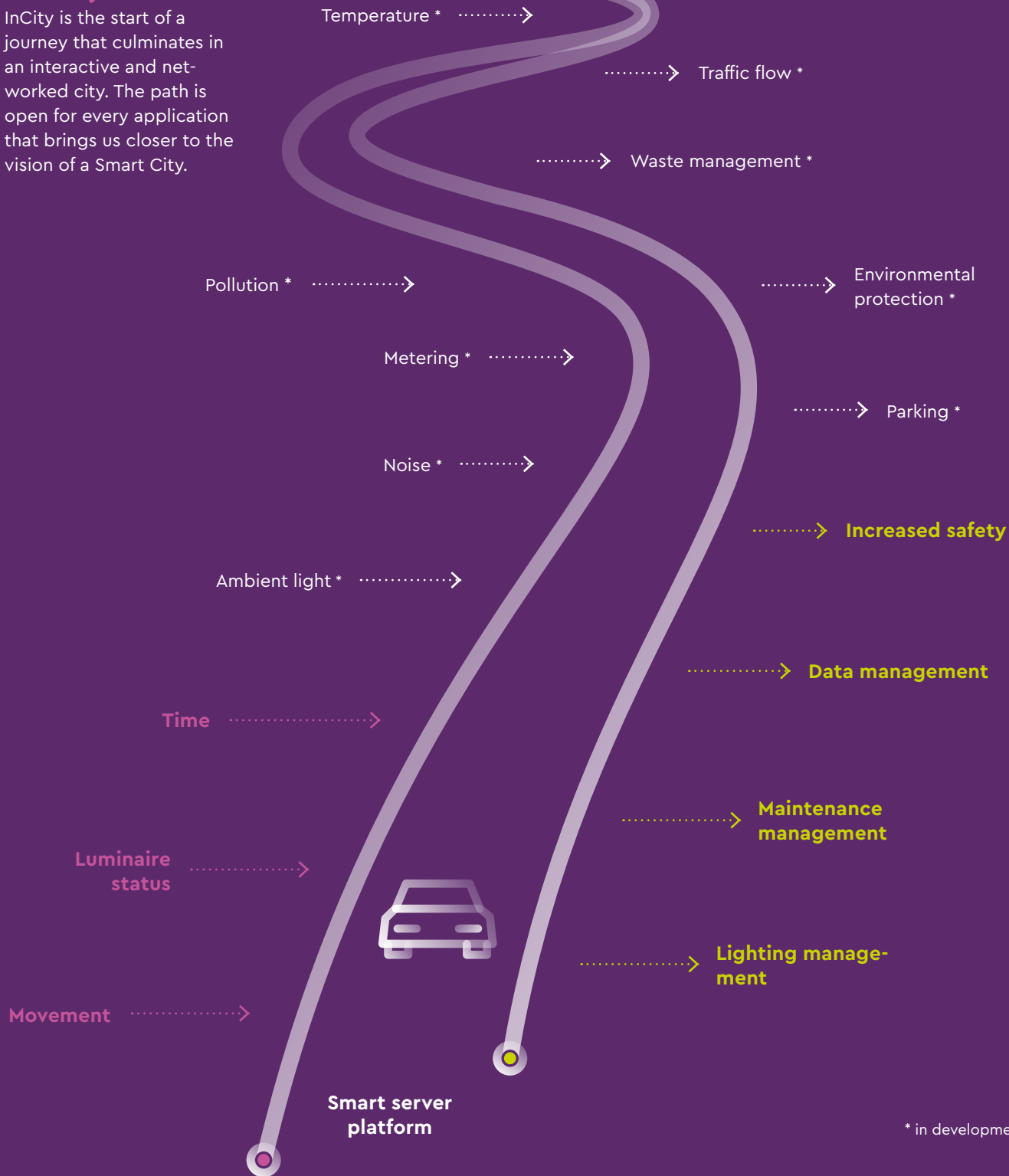
Very few cities or local authorities change their entire outdoor lighting overnight, so the ideal solution is a system that can be constantly adjusted in terms of size and scale. InCity enables individual areas to be centrally managed using the latest lighting controls, even when they are geographically independent from one another. If some larger residential areas are not yet complete, InCity simply grows with the development. Individual luminaires or streets can be added to the system in just the same way as a new district. At the same time, retrofit solutions enable the integration of existing luminaires from other manufacturers.

InCity offers the same high level of flexibility when it comes to the range of functions. Thanks to a network of open and standardised interfaces, the system can be extended at any time with new types of sensor or actuator. Any software updates can be made via the internet. If the customer already has a management system in place, InCity shows its qualities as a team player, as open software interfaces mean that customers can keep their integration options open.



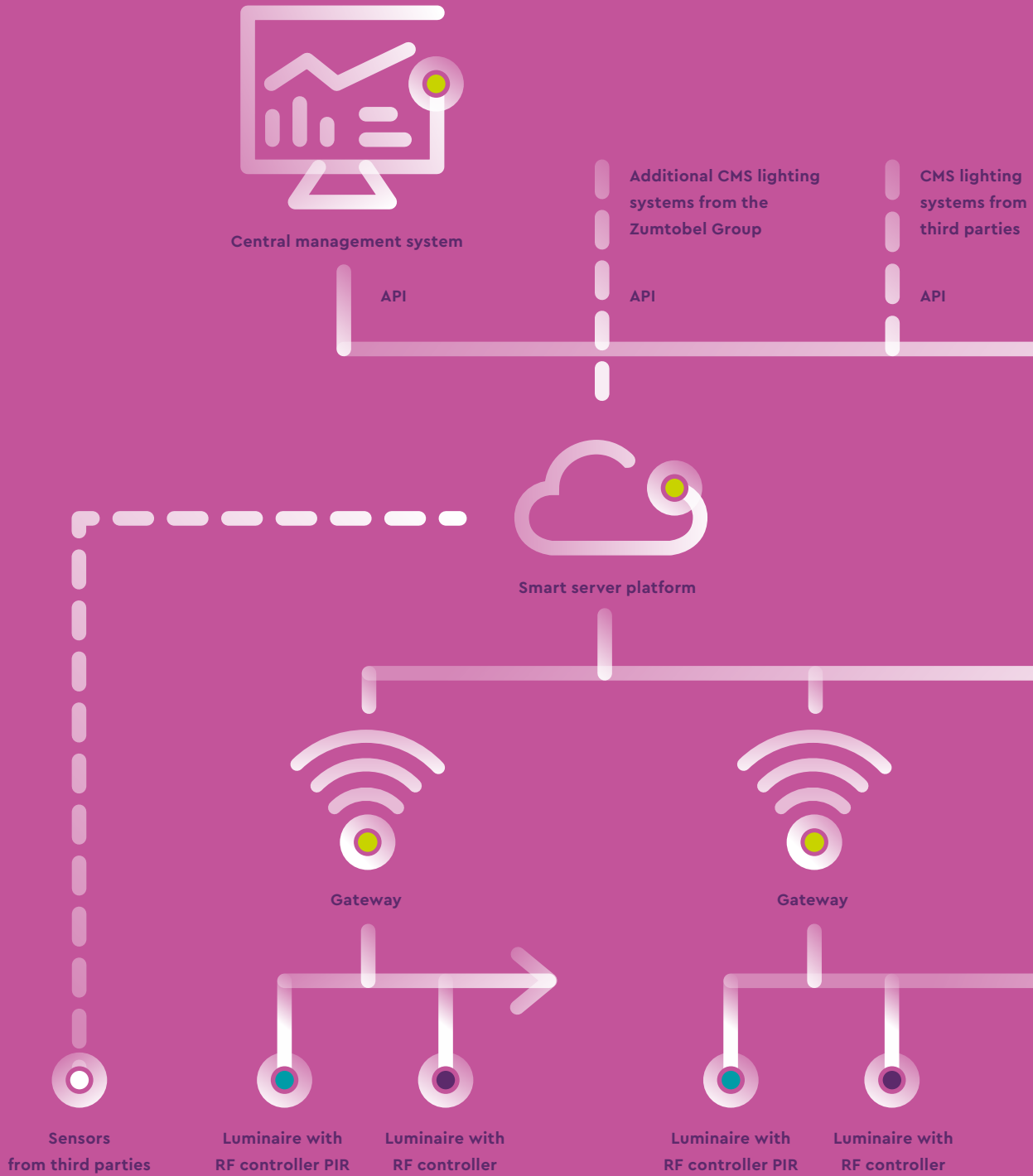
Smart City

InCity is the start of a journey that culminates in an interactive and networked city. The path is open for every application that brings us closer to the vision of a Smart City.



InCity system

Flexible in all directions





InCity functions

A wealth of possibilities

InCity relies on wireless communication technologies, because there are normally no control lines for luminaire dimming in outdoor areas. A 2.4 GHz remote connection provides a secure and reliable basis between the luminaires and from the luminaires to the gateway. The gateway offers Ethernet and WLAN interfaces for connection to the server, along with the option of inserting a SIM card.

A platform for professional support

Connecting every lighting system to a central management system opens up a wealth of possibilities, including maintaining a handy overview of even the most complex installations and simultaneously reaping the qualitative and quantitative benefits from the data collected.



Central management system



Smart server platform



Gateway



Overview

Lighting Control

- Unlimited number of luminaires
- Individual control of single luminaires or luminaire groups
 - based on lighting profiles
 - based on the astronomical clock
 - based on motion detectors
 - as a 'train of light' (companion light)

Commissioning the system

- On site or by remote control
- Individual adjustment of user profiles
- Automatic CMS-integration of installed luminaires with a smart phone app
- Recording of commissioning stages

Monitoring and maintenance of the system

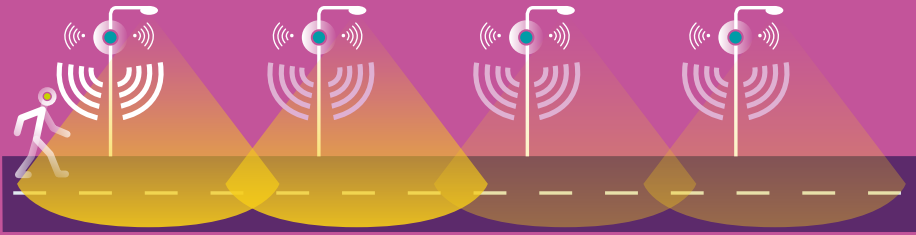
- Map-based representation
- Analysis of energy consumption
- Analysis of motion reports
- Presentation of the results using tables and heatmaps
- Display and reporting of luminaire and system errors
- Regular updates of the system information
- Automatic notification by email (in development)

Smart City functions (on request)

- Connection of additional sensor types
- Connection of additional actuators
- Integration of other providers into the CMS system

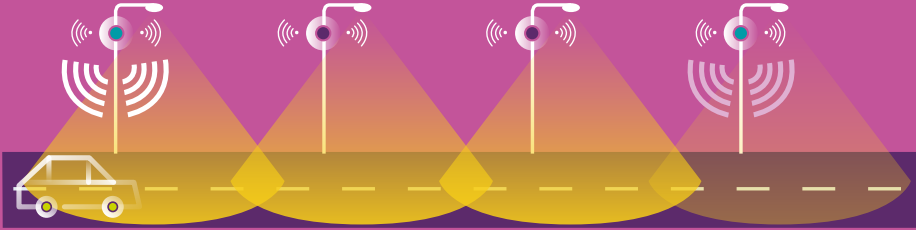
For maximum safety and efficiency

Transport routes, squares and public amenities are used in a variety of different ways. With a broad range of functions and flexible combinations, InCity can offer the right solution for every application.



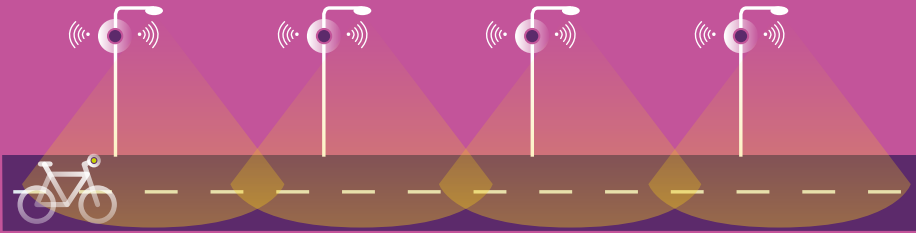
Highest flexibility
Each individual luminaire is controlled by motion detection, lighting profiles and the astronomical clock.

Wireless network with motion detectors





Optimised for the situation
Luminaire groups are controlled by motion detection, lighting profiles and the astronomical clock.

Wireless network (with motion detectors in some instances)



Time-linked
Luminaires are controlled by lighting profiles and the astronomical clock - but not by motion detection.

Wireless network

-  RF controller PIR
-  RF controller

InCity hardware

A reliable basis



RF controller I/E

Luminaire module for wireless communication with the InCity system, in line with pre-set lighting profiles and sensor information.

For mounting on masts: RF controller E.
For installation in the luminaire: RF controller I.

- Lighting control via standardised DALI interface
- Integrated astronomical clock
- Wireless remote connection to the gateway
- Regular automatic synchronisation with the RF gateway for current status and error messages
- Remote updates option - without the need for a service technician on site



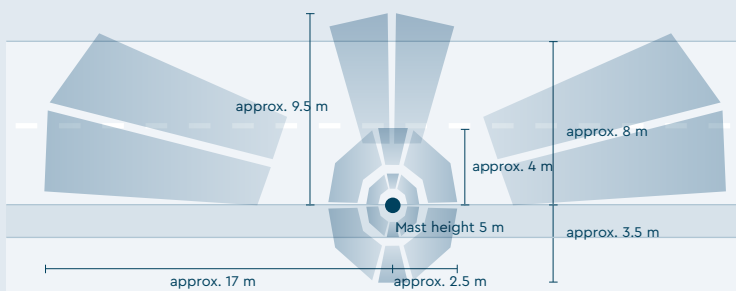
RF controller PIR

Luminaire module for wireless communication with the InCity system. An integrated sensor system means that motion detection and system communication can take place within the same component.

For mounting on masts.

In addition to the functions of the RF controller:

- Integrated sensor system to record the movement of vehicles and people
- Four independent sensors that together monitor a uniquely large detection area
- Option for train-of-light applications (companion light)



With four independent sensors, the RF controller PIR detects movements from all directions: to the right and left along the street and directly below the luminaire, as well as to the front and on the opposite side of the street.



RF gateway

Network module for communication with up to 200 RF controllers from the InCity system and for collecting data that is passed on to the CMS system. The gateway records regular system data, sensor data and status information from the RF controller, sends this to the InCity lighting management system and in return transmits changes from the management system to the RF controller.

For mounting on masts.

- Wireless remote connection to the RF controllers
- Connection with data server and management system using an integrated SIM card or via LAN or WLAN
- Regular automatic synchronisation with the lighting management system
- Remote updates option - without the need for a service technician on site
- Regular logging of the system operation with customised scheduling
- Large local memory capacity to prevent data loss during connection errors

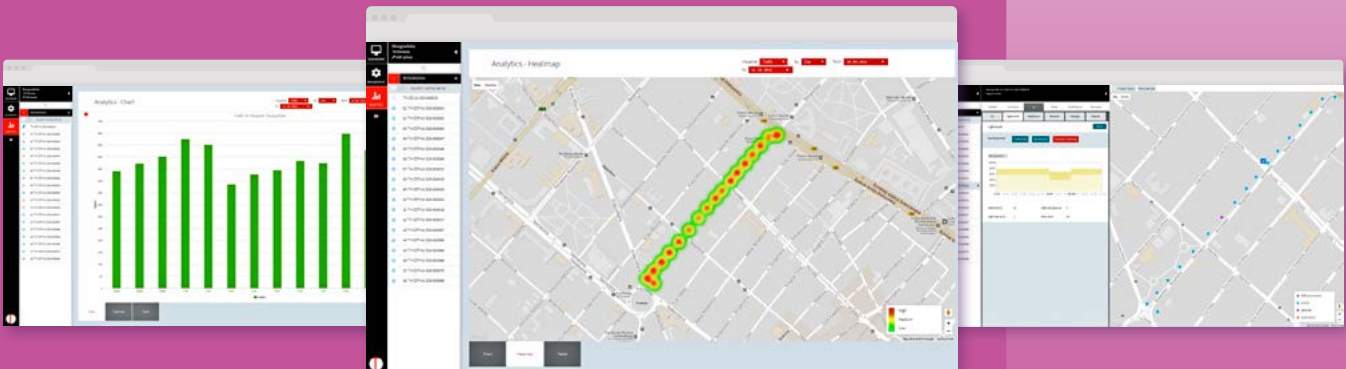
InCity software

Solution-oriented data management

Lighting management system

Software for the professional support, monitoring and maintenance of outdoor lighting systems. User-friendly interfaces, time-saving automation and high standards of security help achieve the desired levels of success. The unlimited number of luminaires and users, open interfaces and ongoing improvements make sure that all requirements are met - today and in the future.

- A personal customer website with a hierarchical structure and password authorisation
- Map-based presentation
- Automatic inclusion of all light points and communication modules
- Calculation of the energy savings
- Analysis of the motion detector data
- Data processing in graphs and heatmaps
- Reporting and notification of error messages
- Regular logging of the system operation
- High level of security through fully encrypted data communication using a server located in the EU, together with redundant server architecture



Clear user interfaces simplify the monitoring and operation of the system. Map-based representation and graphical data processing using charts and heatmaps ensure that even complex information can be quickly and easily understood.

Typical applications

A system that satisfies the most varied requirements

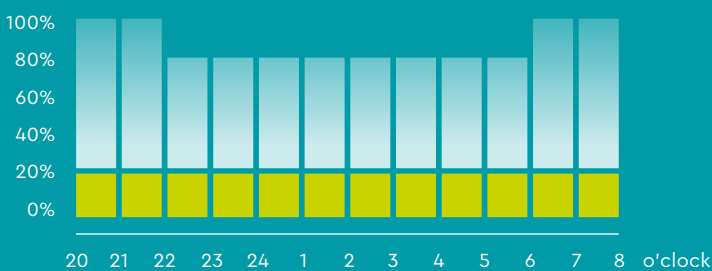


Side streets and cycle paths

The onset of dusk brings peace to many routes. Constant illumination at 100 percent consumes too much energy and disturbs the sleep of local residents. Lighting that accompanies pedestrians on their way home is therefore recommended to sensibly reduce light levels without compromising safety.



Example lighting profile



● Basic lighting

○ Illumination with motion detection

Main function

Train of light (companion light)

Benefits

Energy consumption savings	○ ○ ○ ○ ○
Maintenance cost savings	○ ○ ○ ○ ○
Comfort	○ ○ ○ ○ ○
Safety	○ ○ ○ ○ ○

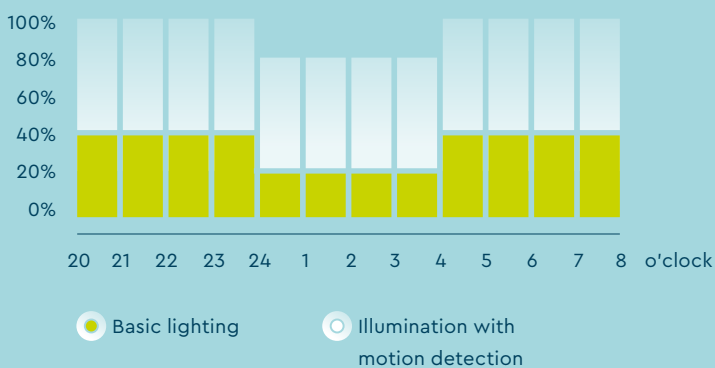


Outdoor areas at railway stations, toll booths and filling stations

Several areas in towns and cities experience significant variance between periods of high usage and quiet times. In such cases, the use of motion detectors helps to achieve the necessary blend of safety and efficiency.



Example lighting profile



Main function

Motion detection

Benefits

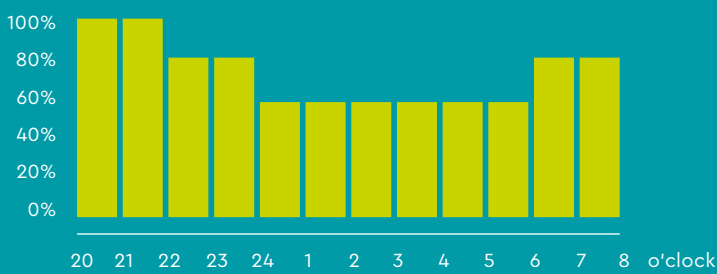
Energy consumption savings	● ● ● ● ●
Maintenance cost savings	● ● ● ● ●
Comfort	● ●
Safety	● ● ● ● ●



Pedestrian zones

Time-dependent control offers several advantages when visitor frequency can be easily predicted - often in line with fixed opening times. This method ensures the right balance between too much and too little light.

Example lighting profile







 Basic lighting

Main function

Time-dependent control

Benefits

Energy consumption savings	
Maintenance cost savings	
Comfort	
Safety	



Car parks

Motion detectors help areas with sporadic usage adapt to the needs of visitors who turn up intermittently.

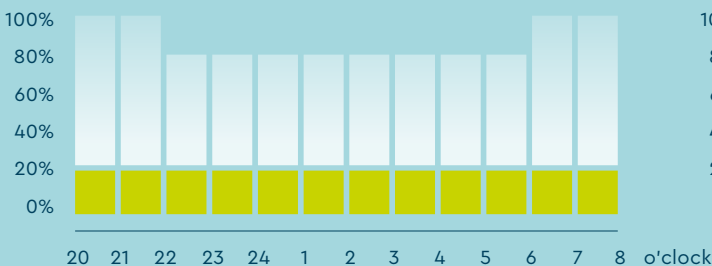
Main function

Motion detection

Benefits

Energy consumption savings	●●●●
Maintenance cost savings	●●●
Comfort	●●
Safety	●●●●

Example lighting profile



● Basic lighting ○ Illumination with motion detection



Industrial sites and airports

Time linking can significantly reduce energy consumption in outdoor applications where there is a clear correlation between frequency of use and time of day – without any loss of quality.

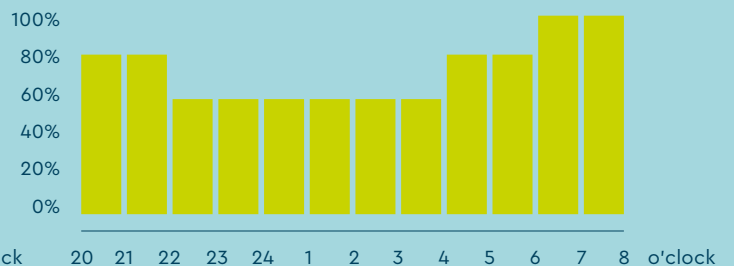
Main function

Time-dependent control

Benefits

Energy consumption savings	●●●●
Maintenance cost savings	●●
Comfort	●
Safety	●●●●

Example lighting profile



● Basic lighting

Zumtobel Group Services

Your service partner in the lighting industry

The Zumtobel Group is renowned around the world for pioneering lighting solutions. Now the launch of ZGS adds an extensive range of new services. From lighting controls and networking (connectivity) to data collection and analysis; from turnkey project management to light contracting; from emergency lighting to lifecycle management of the complete lighting infrastructure - ZGS provides a comprehensive portfolio of bespoke ready-to-use solutions.

Data-based Services

New insights, enhanced customer satisfaction

Digital technologies are changing both the way we live and the way we use light. Our team of experts will help you understand your requirements when it comes to networked lighting, enabling optimal usage of existing infrastructure or complete buildings by incorporating features such as remote moni-

toring and room management. The Internet of Things is creating genuine added value that has spawned a range of new services and business models. Our integrated approach makes us a popular partner for leading technology companies, paving the way for a series of ground-breaking project initiatives in the field of connected buildings and cities.

Finance Services

Lights that pays for itself

NOW provides you with the very best light for your company – while you pay nothing but the running costs. You do not even need to worry about the installation of the luminaires or the commissioning and maintenance of the system.

This is all taken care of by our experts, as you would expect when you choose a complete and cost-effective solution – a solution that harnesses the most efficient lighting on the market to minimise both energy consumption and operating costs.

Turnkey Services

Tailored lighting solutions from a single provider

COMPLETE enables you to combine any number of Zumtobel Group products and services into a single individual solution. This includes everything from specifications, planning and project management to installation and even

maintenance, which is available on request. The only things that count are your specific wishes and requirements. ZGS then develops needs-based complete solutions from a single source – solutions that can be realised immediately anywhere in the world.

Technical & Maintenance Services

Lifecycle management for your lighting

The technical services from ZGS start with professional commissioning of lighting systems and continue with maintenance, routine testing and regular optimisation. We offer you worldwide assistance – either on site or using remote analysis. Our expert support improves the quality of light, maximises energy efficiency

and guarantees outstanding reliability. We can also call on years of experience to help train the personnel who work with the solution on a daily basis. In line with a commitment to tailor our services to suit your individual requirements, product guarantees can also be extended.

United Kingdom

ZG Lighting (UK) Limited
Chiltern Park
Chiltern Hill, Chalfont St. Peter
Buckinghamshire SL9 9FG
T +44/(0)1388 420 042
info.uk@zumtobelgroup.com
zumtobel.co.uk

USA and Canada

Zumtobel Lighting Inc.
3300 Route 9W
Highland, NY 12528
T +1/845/691 6262
F +1/845/691 6289
info.us@zumtobelgroup.com
zumtobel.us

Australia

ZG Lighting Australia Pty. Ltd.
43 Newton Road
Wetherill Park NSW 2164
T +61/1300 139 965
info.au@zumtobelgroup.com
zumtobel.com.au

New Zealand

ZG Lighting (NZ) Limited
27 Jomac Place,
Avondale, Auckland 1026
PO Box 71134, Rosebank,
Auckland 1348
T 0800 800 834
T +64/(9) 828 7155
F +64/(9) 820 7591
info.nz@zumtobelgroup.com
zumtobel.co.nz

China

Thorn Lighting (Guangzhou) Limited
12A Lian Yun Road
Eastern Section,
GETDD, Guangzhou
510530, P.R. China
T +86(20)2232 6000
Sales Hotline: 400 8080 195
info.cn@zumtobelgroup.com
zumtobel.cn

Hong Kong

ZG Lighting Hong Kong Ltd.
Unit 503 – 508, 5/F, Building 16W,
Phase 3, Hong Kong Science Park,
New Territories, Hong Kong
T +852/(0)2578 4303
F +852/(0)2887 0247
info.hk@zumtobelgroup.com

India

Thorn Lighting India Pvt. Ltd.
No. 43, Chamiers Road
Raja Annamalaipuram,
Chennai 600028,
Tamilnadu, India
T +91/(44) 2435 7588
F +91/(44) 2435 8744
info.in@zumtobelgroup.com

Singapore

ZG Lighting Singapore Pte. Ltd.
158 Kallang Way # 06-01/02
Singapore 349245
T +65/6844 5800
F +65/6745 7707
info.sg@zumtobelgroup.com

United Arab Emirates

Zumtobel Lighting GmbH
4B Street, Al Quoz Industrial Area
Dubai, United Arab Emirates
T +971/4 340 4646
info.ae@zumtobelgroup.com
zumtobel.ae

Romania

Zumtobel Lighting Romania SRL
Radu Greceanu Street, no.2,
Ground Floor, sector 1
012225 Bucharest
T +40 31225 38 01
F +40 31225 38 04
info.ro@zumtobelgroup.com
zumtobel.com

Hungary

ZG Lighting Hungary Kft.
Váci út 49
1134 Budapest
T +36/(1) 450 2490
F +36/(1) 350 0829
info.hu@zumtobelgroup.com
zumtobel.hu

Croatia

ZG Lighting d.o.o.
Ulica Petra Hektorovića 2
10000 Zagreb
T +385/(1) 64 04 080
F +385/(1) 64 04 090
info.hr@zumtobelgroup.com

Bosnia and Herzegovina

ZG Lighting d.o.o.
Predstavništvo u BiH
Zmaja od Bosne 7
71000 Sarajevo
T +387 33 590 463
info.ba@zumtobelgroup.com

Serbia

ZG Lighting d.o.o.
Beton hala – Karađorđeva 2-4
11000 Belgrade
M +381 69 54 44 802
info.rs@zumtobelgroup.com

Czech Republic

ZG Lighting Czech Republic s.r.o.
Jankovcova 2
Praha 7
170 00 Praha
T +420 266 782 200
F +420 266 782 201
info.cz@zumtobelgroup.com
zumtobel.cz

Slovak Republic

ZG Lighting Slovakia s.r.o.
Tomášikova 64
831 04 Bratislava
T +421 2 2030 0044
info.sk@zumtobelgroup.com
zumtobel.sk

Poland

ZG Lighting Polska Sp. z o.o.
Wołoska 9a
Platinum Business Park III
02-583 Warszawa
T +48 22 856 74 31
info.pl@zumtobelgroup.com
zumtobel.pl

Slovenia

ZG Lighting d.o.o
Štukljeva cesta 46
1000 Ljubljana
T +386/(1) 5609 820
F +386/(1) 5609 866
info.si@zumtobelgroup.com
zumtobel.si

Russia

Zumtobel Lighting GmbH
Official Representative Office
Skakovaya Str. 17
Bld. No 1, Office 1104
125040 Moscow
T +7/(495) 945 36 33
F +7/(495) 945 16 94
info.ru@zumtobelgroup.com
zumtobel.ru

Norway

ZG Lighting Norway AS
Bygdøy allé 4
0257 Oslo
T +47 22 54 72 00
info.no@zumtobelgroup.com
zumtobel.no

Sweden

ZG Lighting Nordic AB
Hyllie Boulevard 10b
215 32 Malmö
T +46 649 20 00
info.se@zumtobelgroup.com
zumtobel.se

Denmark

Lighting Denmark A/S
Stamholmen 155, 5. sal
2650 Hvidovre
T +45 35 43 70 00
info.dk@zumtobelgroup.com
zumtobel.dk

Headquarters

ZGS Zumtobel Group Services
Schmelzhütterstraße 26
6850 Dornbirn
Austria
T +43 (5572) 390-0
info@zumtobelgroup.com

zgservices.com

**Top quality – with a five-year guarantee.**

As a globally leading luminaire manufacturer, Zumtobel provides a five year manufacturer's guarantee on all Zumtobel branded products in accordance with the terms of guarantee at zumtobel.com/guarantee.

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