# SIDEREA

## Citizen Centric Lighting

TRIDONIC

# SIDEREA

# Citizen Centric Lighting

## Light that follows the rhythm of life

### Scalable
from the individual luminaire
to the smart city

### Future-proof
through compliance with the latest
industry standards such as ZD4i

### Sustainable
with energy-saving potential of up to 80 %

**Outdoor lighting is one of the most omnipresent power grids in cities. The switch to LEDs has made street lighting more efficient and reduced energy costs. But outdoor lighting can also be the starting point on the road towards the digital city. SIDEREA makes outdoor lighting smart.**

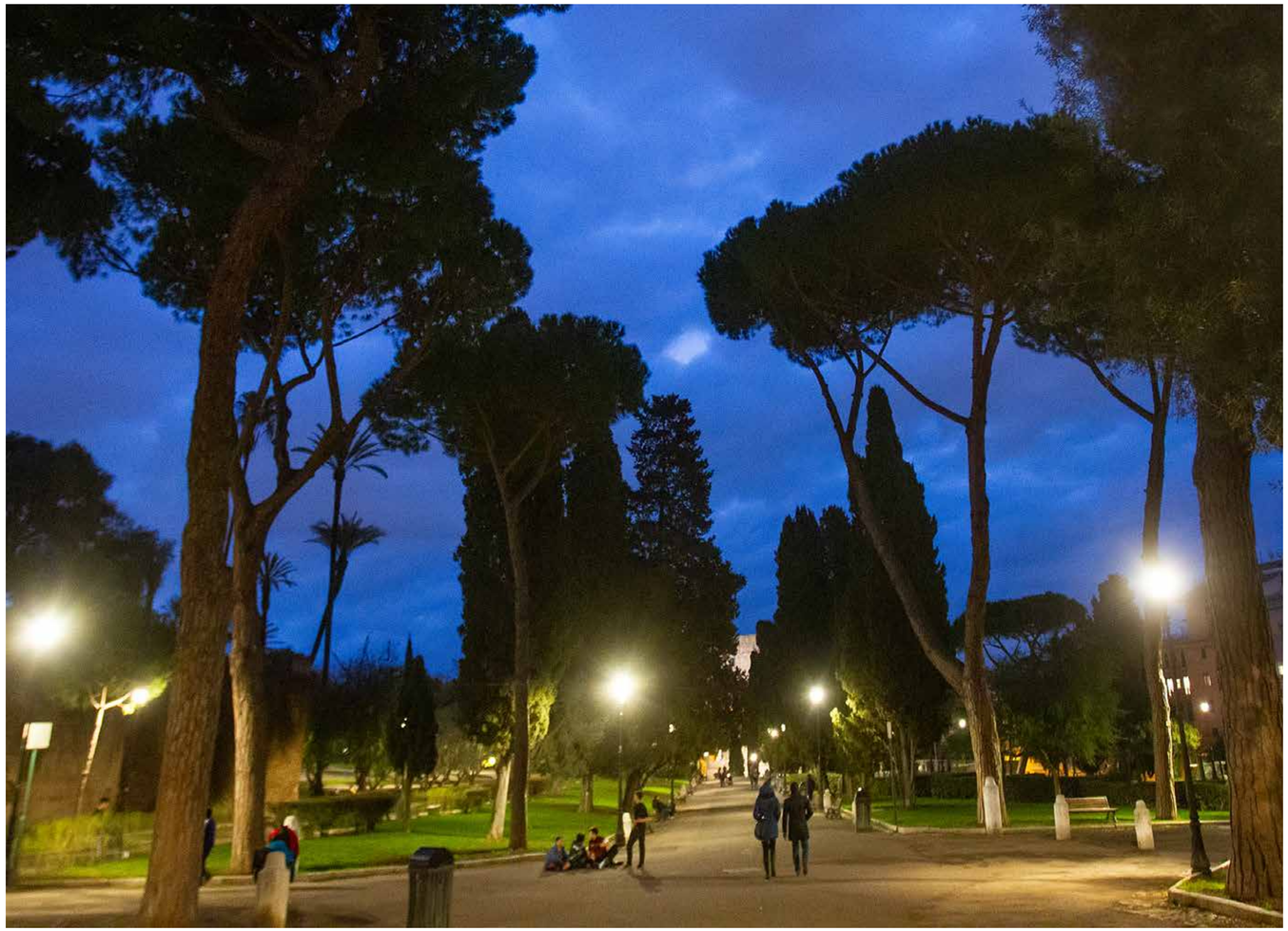
The portfolio complies with the latest standards such as Zhaga Book 18 and D4i, which provide the basis for smart, future-proof LED luminaires with IoT connectivity. Thanks to plug-and-play interoperability, sensors and communication nodes can be easily added or updated, which is a great advantage for installers and end users as further technological developments can be easily adapted.

# Intelligent standardised control

## For safety and efficiency

**Just a few years ago, you had to choose between safety and saving energy and costs when it came to lighting on public paths, streets and squares. Today, with an intelligent control system, you can ensure both - safety and efficiency, simply by automatically controlling your outdoor lighting in a sensible and reliable way.**

How these controls work and what we have to offer you with SIDEREA in detail, you can find out in this brochure.



Up to 80 % energy saving

# Our small contribution

## On a *great* mission

**Tridonic is convinced that the lighting industry has to develop solutions for the most challenging project to date: safeguarding our planet and its natural resources.**

We at Tridonic believe that products and the way we produce them must be questioned and rethought. As a technology company, we see the consistent orientation of our processes and products towards sustainability as the only way forward. This is a big step and a great challenge. For us, for our customers and for our partners.

**Up to 80 % energy saving**

**#parisclimate**
**#EUGreenDeal**
**#circularEconomy**
**#sustainableproductinitiative**
**#reclaimthestreets**
**#darksky**

**Award-winning innovation**

Vorarlberg Innovation Award 2021

Innovationspreis
2021

Demand oriented
lighting thanks
to SIDEREA control

# Award-winning innovation

## Vorarlberg Innovation Award 2021

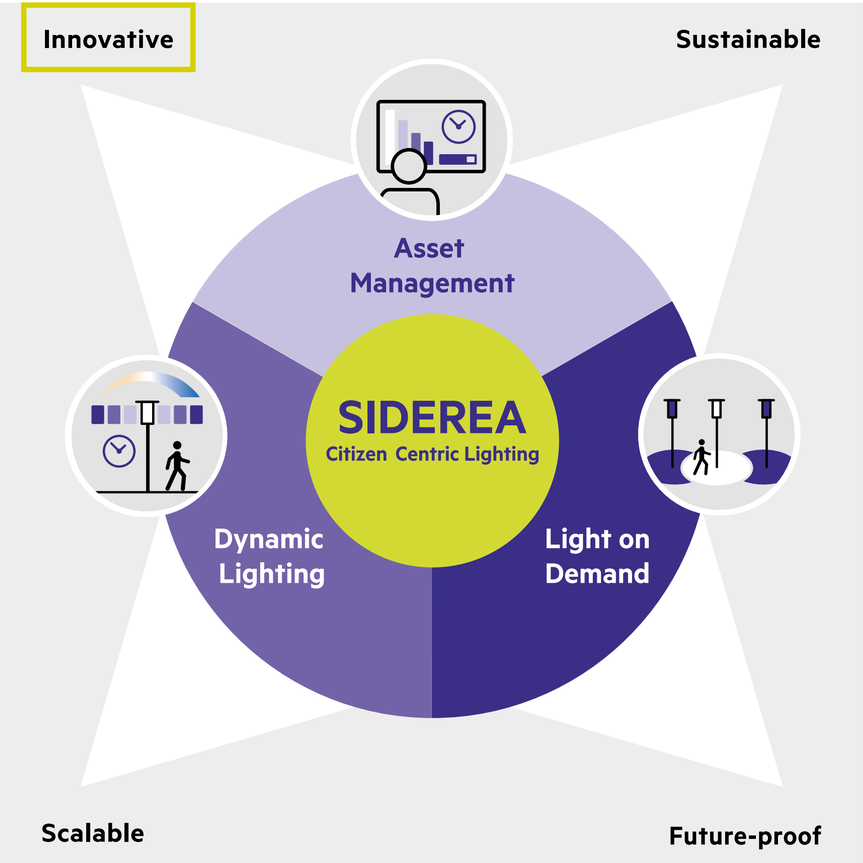
**It makes us proud that the SIDEREA product line delivers top performance day after day. And we are doubly proud that its outstanding performance has been recognised with the Innovation Award from the Austrian state of Vorarlberg.**

*Excerpt from the jury statement for the award of the Vorarlberg Innovation Prize 2021.* "SIDEREA makes outdoor lighting intelligent and can therefore reduce energy consumption by 86 percent compared to conventional street lighting, and maintenance costs by up to 50 per cent".

Innovationspreis
2021

# Digital towns and cities

Security and *openness* through standardisation

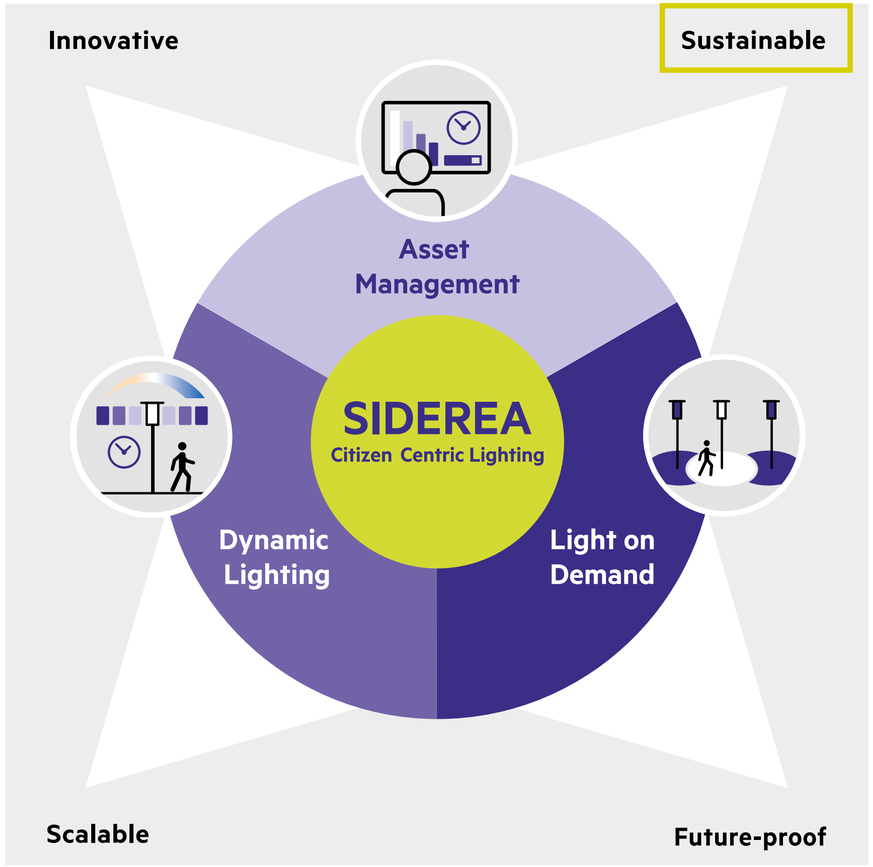



## Innovative

On the basis of many years of experience and in dialogue with visionaries and experts in luminaire technology, Tridonic develops user-oriented innovations of contemporary importance enabling cities to develop into "digital cities".

# Digital towns and cities

## Security and *openness* through standardisation

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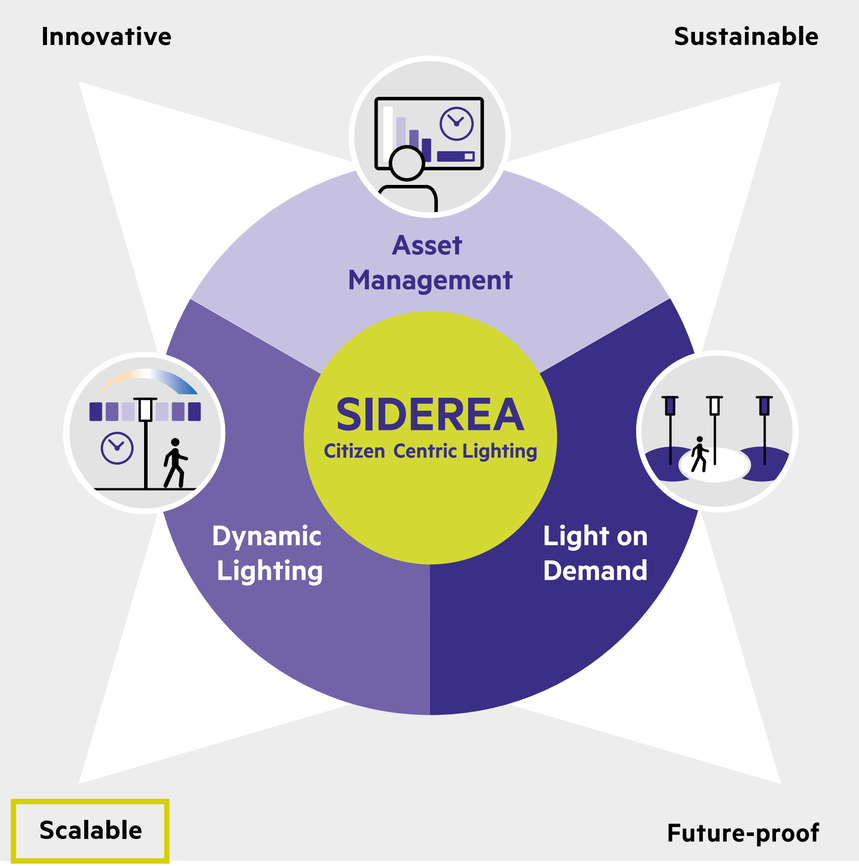
# Digital towns and cities

## Security and *openness* through standardisation

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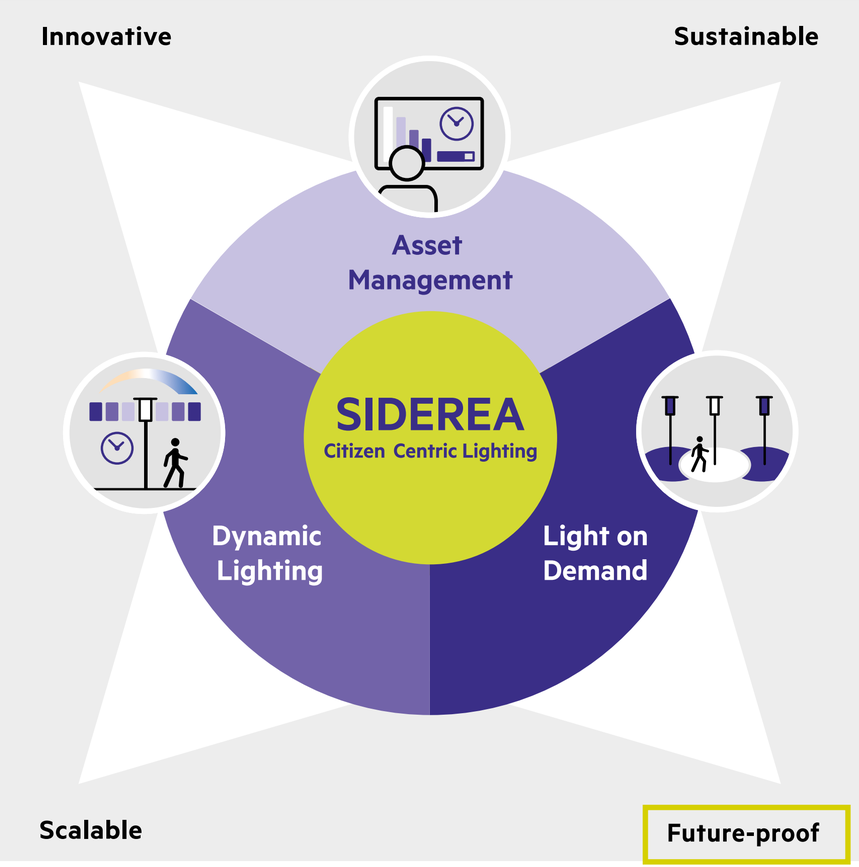
With up to 80 % energy-saving potential.

**Scalable**

Solutions from the individual luminarie to the smart city.

# Digital towns and cities

## Security and *openness* through standardisation




**Innovative**
On the basis of many years of experience and in dialogue with visionaries and experts in luminaire technology, Tridonic develops user-oriented innovations of contemporary importance enabling cities to develop into "digital cities".

**Sustainable**
With up to 80 % energy-saving potential.

**Scalable**
Solutions from the individual luminarie to the smart city.

**Future-proof**
Save 30 % technology cost by applying the latest and interoperable industry standards such as **ZD4i, 6LoWPAN, uCIFI, TALQ**

# From the single luminaire to the digital city

> As a community leader, it is important to me to protect nature and the environment as much as possible for the benefit of my grandchildren. To this end, I am committed to safe, demand-oriented and sustainable lighting.

# SIDEREA for towns and cities

## From *intelligent luminaire components* to the urban network

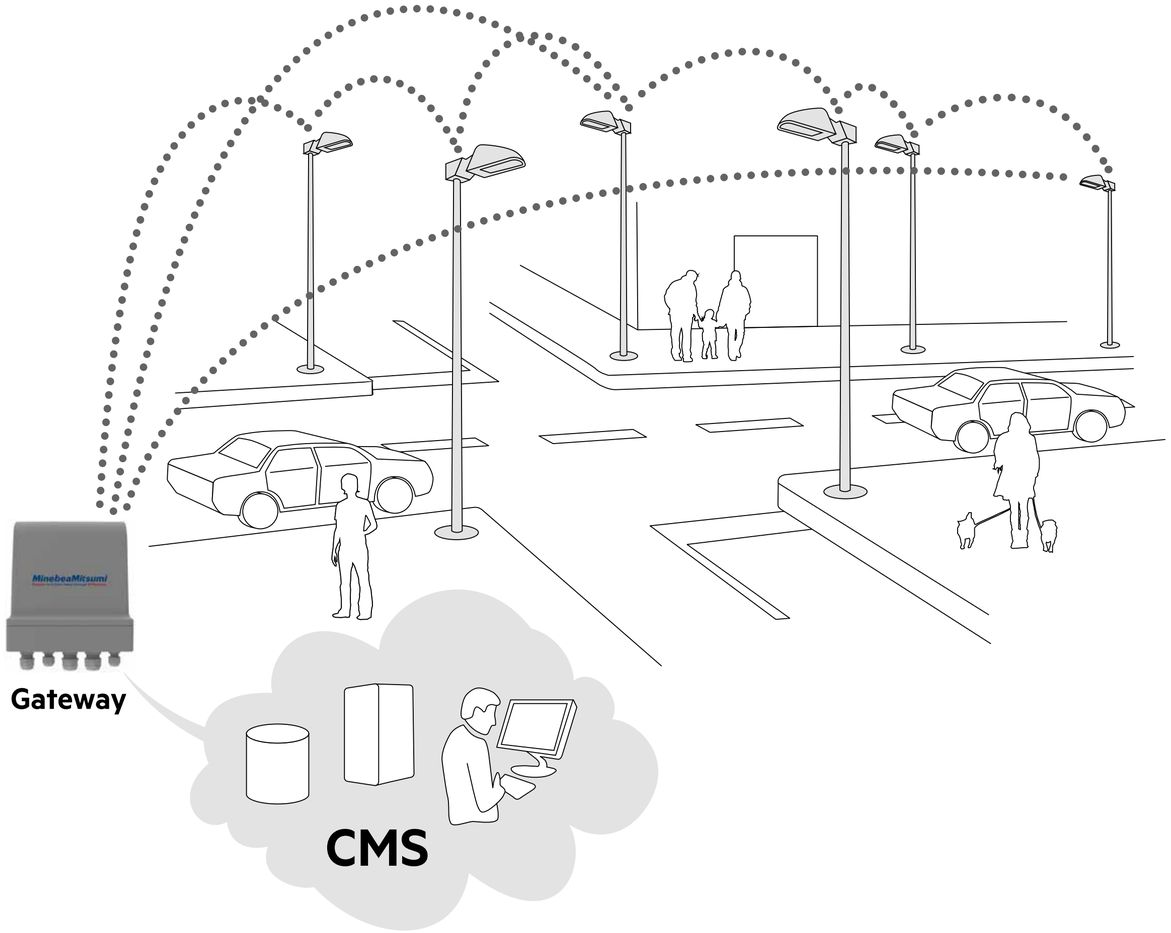
**A modern infrastructure is an essential step towards the smart and digitally connected city of the future. Urbanisation, climate change and digitalisation require new ways of thinking and solutions in towns and cities. With SIDEREA, Tridonic delivers a new lighting solution with a comprehensive portfolio for outdoor lighting in the smart city.**

# SIDEREA for towns and cities

## From intelligent luminaire components to the *urban network*

**Urban networks in smart cities cannot be limited to connecting devices and automating processes: They are about data becoming tangible value for the benefit of all. Smart Lighting serves as backbone to host a number of urban applications, like waste management, park management smart metering etc.**

The Central Management System (CMS) collects and links the data from all integrated devices. With the integration in smart city platforms users can interact with the data and use them for decision making.



# SIDEREA for towns and cities

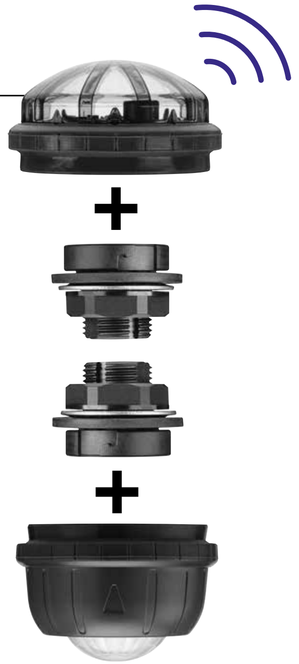
## Industry standard Zhaga-D4i

Zhaga-D4i certified luminaries lay the foundation for a future proof lighting base of cities, by making use of the data provided by the luminarie (D4i) and being able to plug and play Sensors and communication nodes (Zhaga). D4i is the uniform standard which allows the secure communication between luminaries and smart-city systems as well as a clean data transfer among them. Consequently cities and muncipalities are getting rid of interoperability issues.

**Standard for physical interface**

**Standardised communication protocol**

Zhaga Book 18



**D4i standardises the way data is stored, transported and processed in DALI-2 drivers.**

**DALI Part 250**
**Bus power supply**

**DALI Part 251**
**Asset Management**

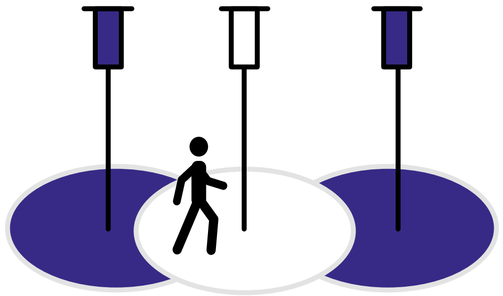
**DALI Part 252**
**Energy use**

**DALI part 253**
**Diagnostics**

**AUX**
**Power supply**

# Application Centric & value-added use cases

For smart city lighting



**Light on demand**

**Dynamic lighting**

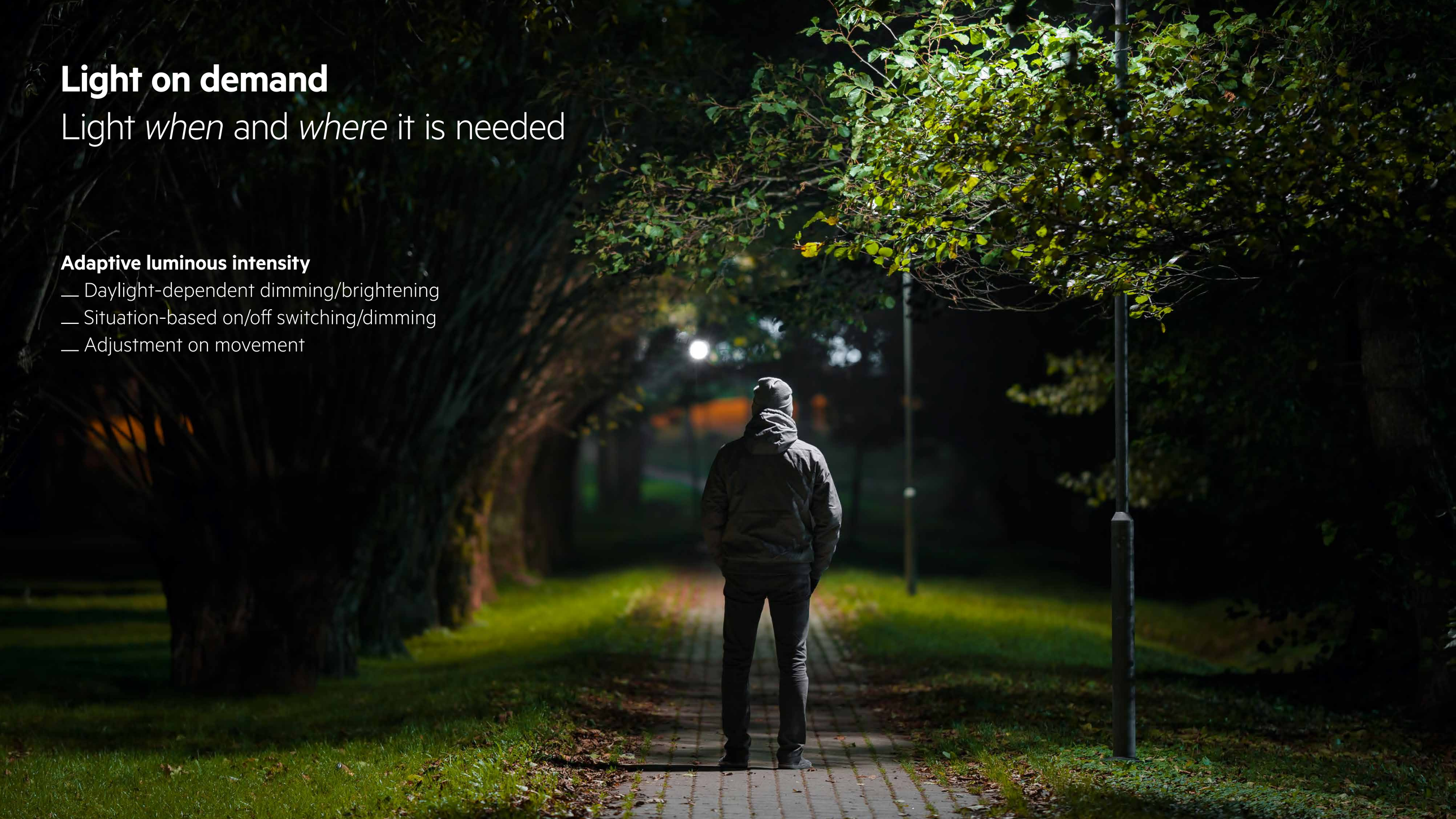
**Asset management**

# Light on demand

Light *when* and *where* it is needed

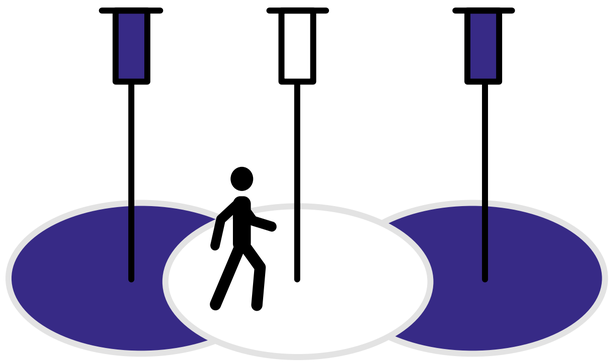
**Adaptive luminous intensity**

— Daylight-dependent dimming/brightening
— Situation-based on/off switching/dimming
— Adjustment on movement



# Light on demand

## Light *when* and *where* it is needed



**More and more people are actively demanding that the environment should be better protected and are longing for "green cities". Towns and cities also face the challenge of implementing the Sustainable Development Goals set by the United Nations by 2030. When it comes to lighting, the solution is to provide the right amount of light only when and where it is needed.**

To do this SIDEREA enables motion sensors to be integrated so that the illuminance can be automatically adjusted depending on the current volume of road users.

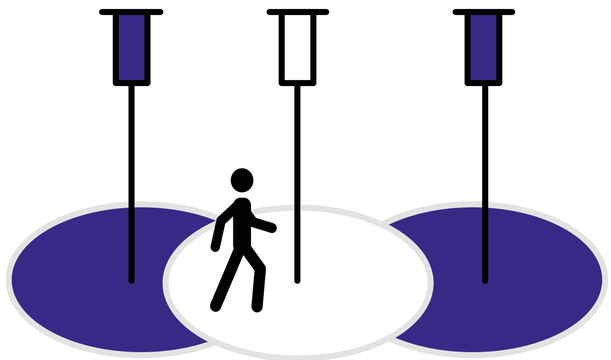
The result? Increased safety on the roads and reduced energy consumption. Night-time rest periods not only help to save costs but also minimise light pollution so that people and animals are disturbed as little as possible at night.

**Light on demand**

Light *when* and *where* it is needed

# Light on demand

## Light *when* and *where* it is needed



Many paths and places are only sporadically used in the dark and at dusk, yet lighting is an important safety factor. Light has been proven to reduce criminal attacks. The solution is to dim down the lights to, say, 10 % when the paths are not in use. This reduces energy consumption and pollution without compromising the safety of the residents by switching off the lights completely.

**Adaptive luminous intensity**

__ Safety for all road users through presence/motion detection
__ Energy savings and less light pollution by dimming the lights on less frequented paths
__ Safety and protection by fading up if motion is detected

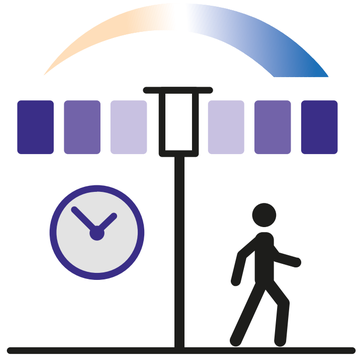
# Dynamic lighting

Drawing *attention* and *directing* emotions

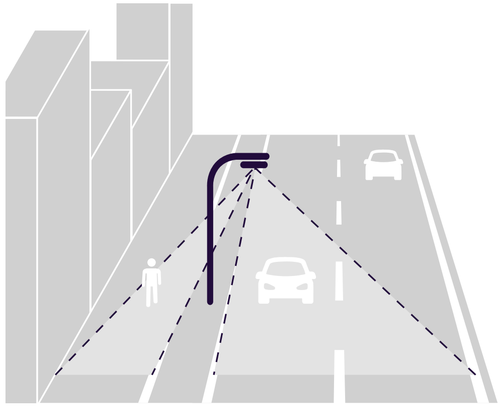
> A change in the colour temperature can improve safety - switching to amber light in fog, for example

# Dynamic lighting

## Drawing *attention* and *directing* emotions



**SIDEREA makes your lighting systems dynamic and flexible. Lighting for footpaths and cycle paths, for example, have different requirements than main roads. Changing weather conditions such as fog or rain lose their terror when the lighting adjusts dynamically to those changes. What‘s more, by actively influencing the lighting mood you can produce creative accents that help market your city.**



**Adaptive llight distribution**

__ Illuminating zones according to usage

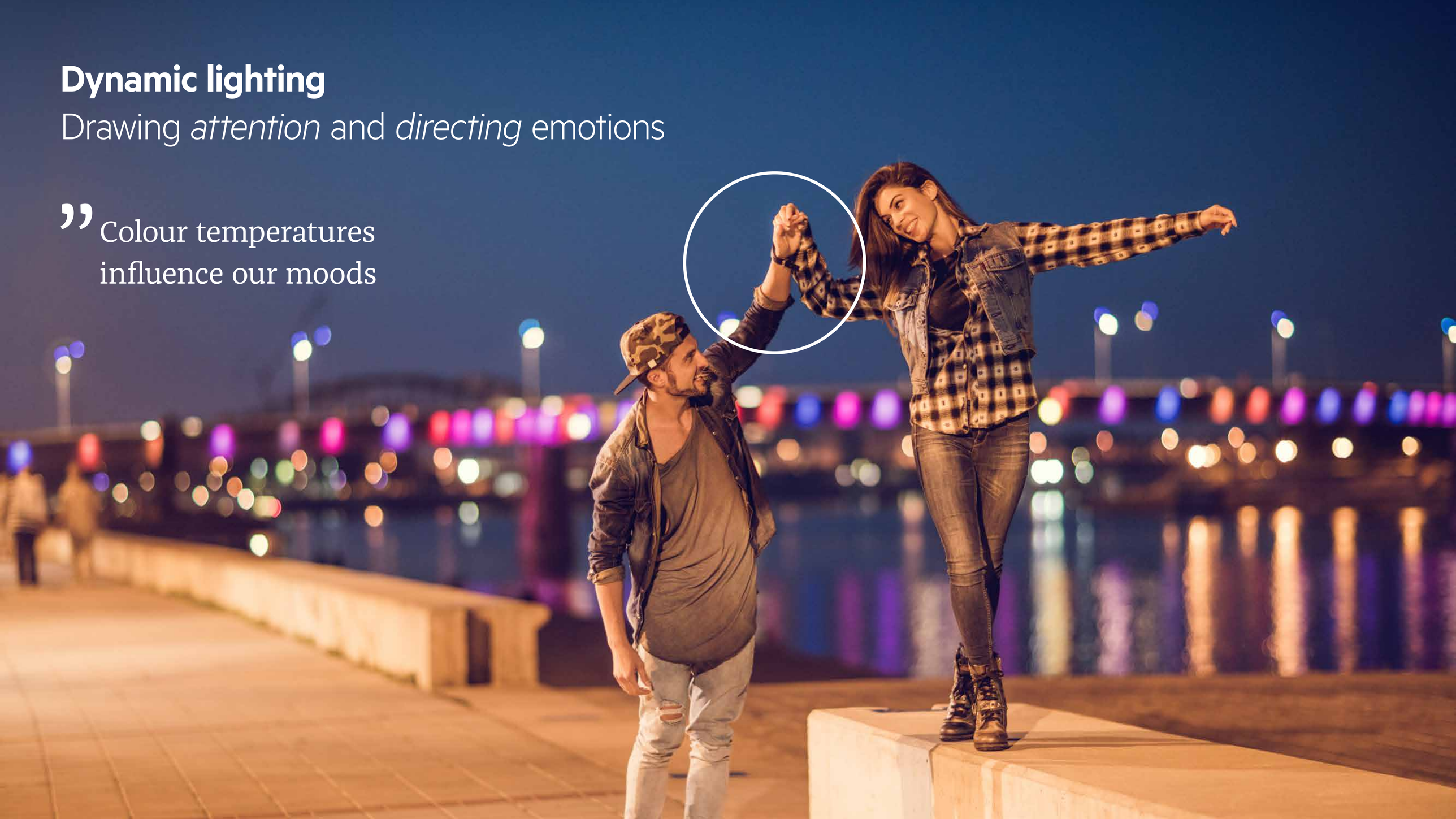
__ Change ratio of direct/indirect light

For optimum safety, roadways and footpaths are illuminated individually or separately. SIDEREA gives you the option of customised lighting.

# Dynamic lighting

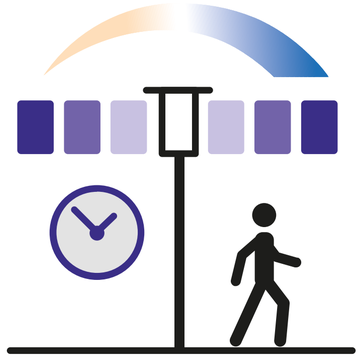
Drawing *attention* and *directing* emotions

> Colour temperatures influence our moods



# Dynamic lighting

## Drawing *attention* and *directing* emotions



For example, a warm light colour that gives a city and its architecture a charming ambience in the evening can be brightened up in the early evening rush hour to promote smooth and safe traffic flows. The appropriate light colour is not least a question of cultural differences. Tunable White solutions enable the lighting to be adapted to local preferences.

**Adaptive Colour Temperature**

__ Colour temperature in the range of 2,700 to 6,500 K
__ Change colour temperature depending on time of day and situation
__ Dimming to warm light
__ Dimming to cold light

”The data compiled enables me to build up a smart city/campus

**Asset management**

Monitoring and controlling luminaires in real time

# Asset management

## Monitoring and controlling luminaires in real time

**Street Lighting accounts on average for 40 % of a city's electricity bill. Costs can be saved if faults are accurately located and diagnosed. Real-time data on remaining service life allows the replacement of individual components to be planned in advance.**

**Operation and maintenance**

__ Planning maintenance and replacement cycles
__ Simplifying network commissioning
__ Accurately monitoring connected objects, receiving warnings and alarms when an event is detected

**Data transmission**

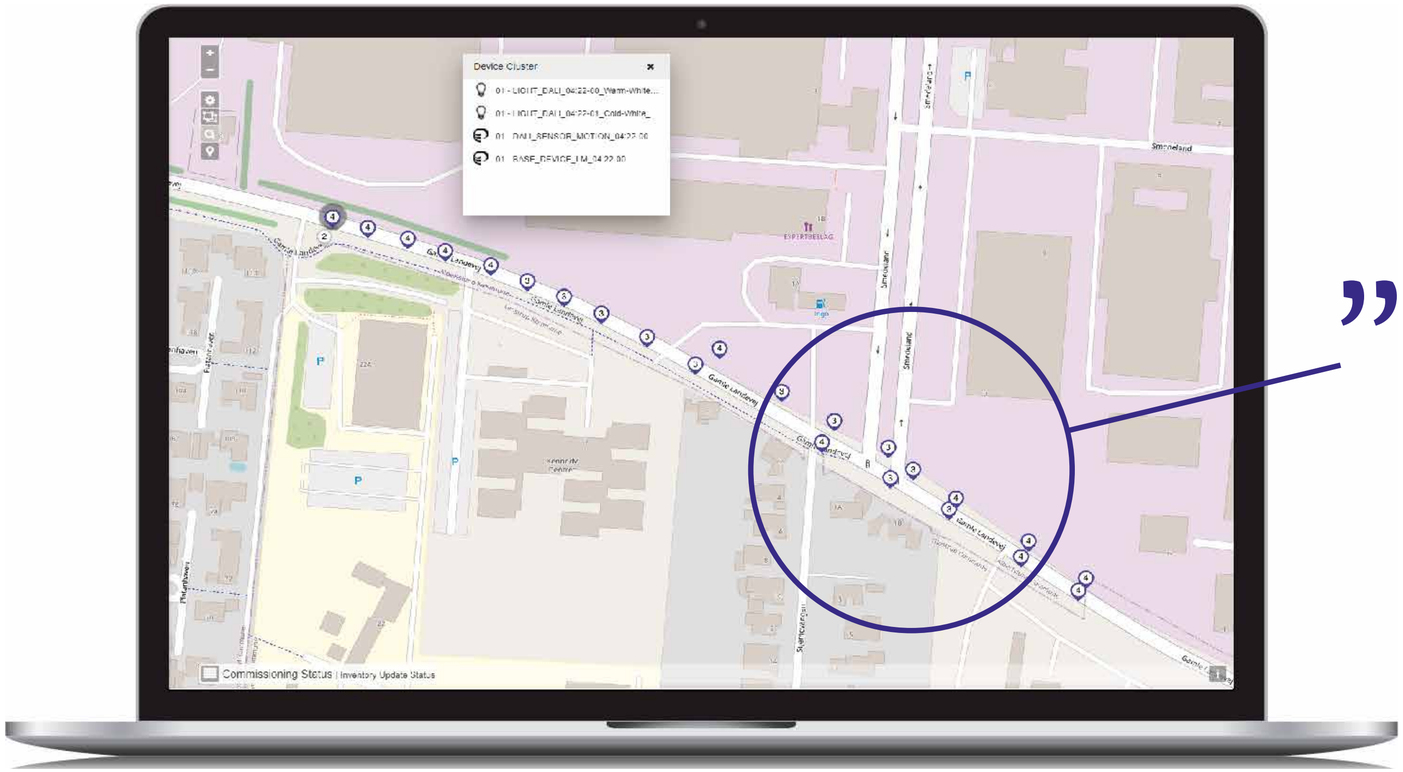
__ Generate customized and actionable reports (e.g. energy costs)
__ Leverage analytics from the daily monitoring (fault management and diagnostics)

**Remote monitoring and control**

__ Monitor all devices onto geographical maps
__ Get real-time measures and send commands to trigger immediate actions (e.g. switch streetlights on/off)

# Asset management

Monitoring and controlling luminaires in real time



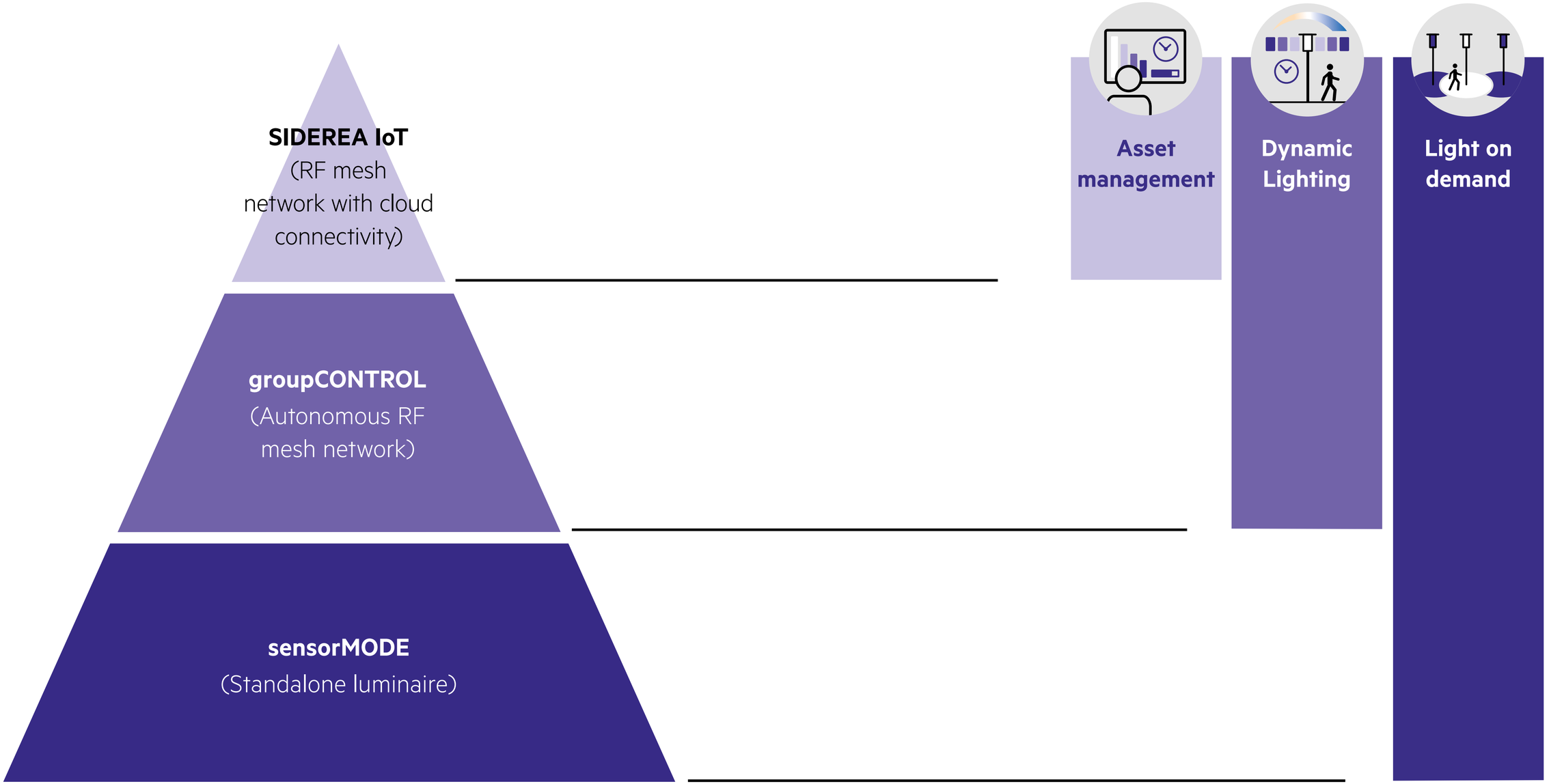

”Tridonic provides accurate and reliable data to manage my luminaires whole life

# Products and systems

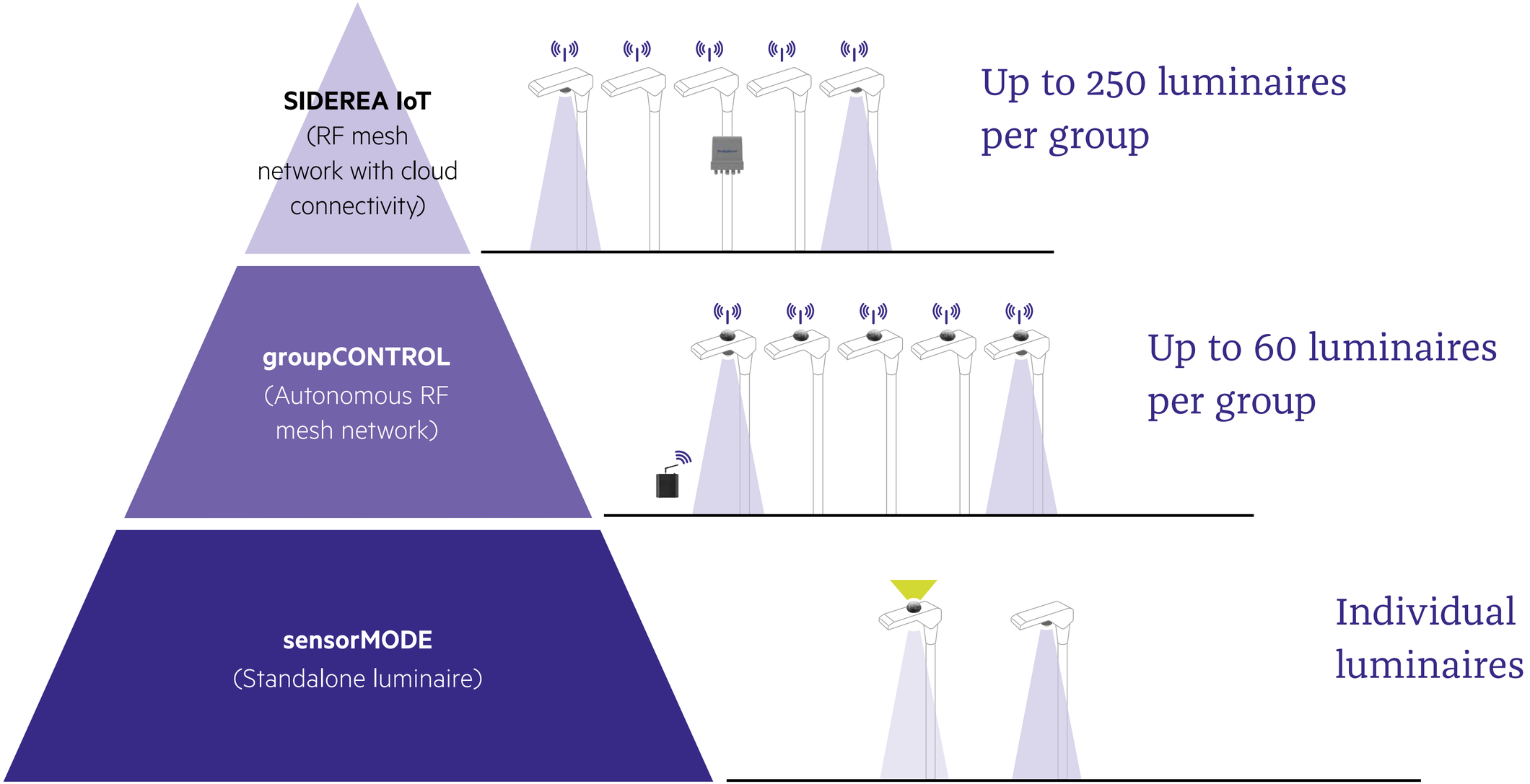
SIDEREA

> Products from Tridonic are easy to install and easy to work with

# The three levels of smart outdoor lighting



# The three levels of smart outdoor lighting



# The three levels of smart outdoor lighting

1 **Light sensor**

Reacts to ambient light

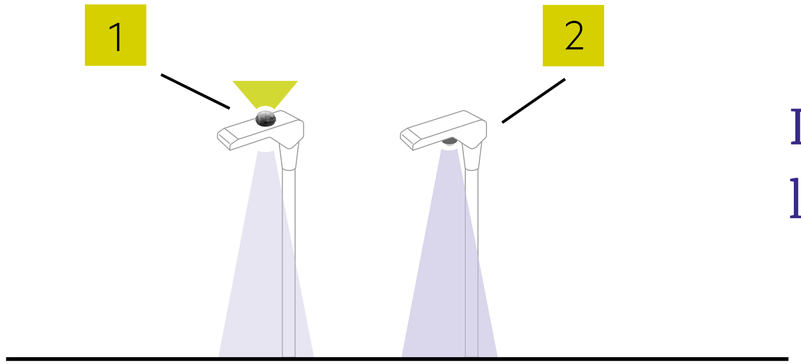
More information >

2 **PIR motion sensor**
**Motion detector**

Responds to movement and ambient light

More information >

**sensorMODE**
(Standalone luminaire)




Individual luminaires

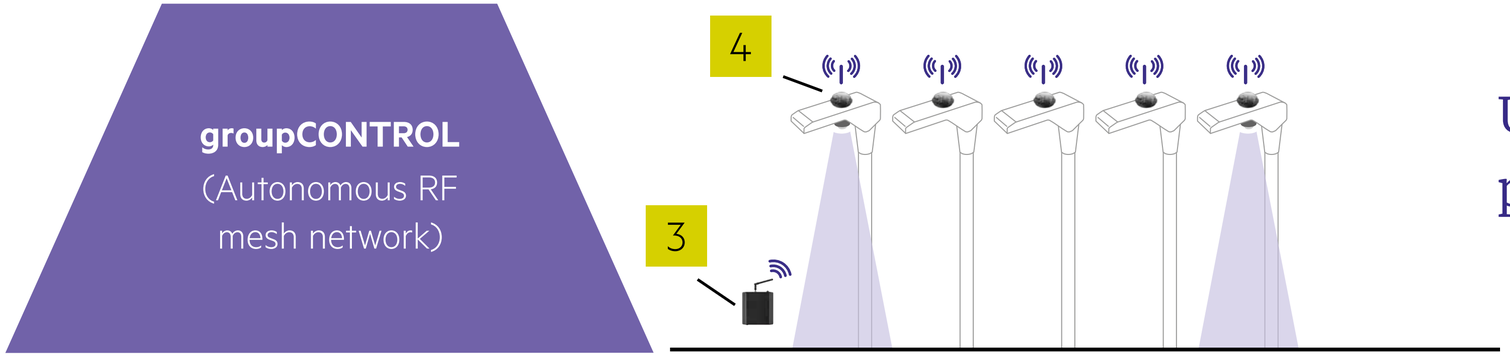
# The three levels of smart outdoor lighting

3 **groupCONTROL Programmer**
commissioning of luminaire groups according to sensors, schedules and events

**More information >**

4 **RF node**
**(with GPS / w/o GPS)**
Dali Multimaster with integrated light sensor

**More information >**




Up to 60 luminaires per group

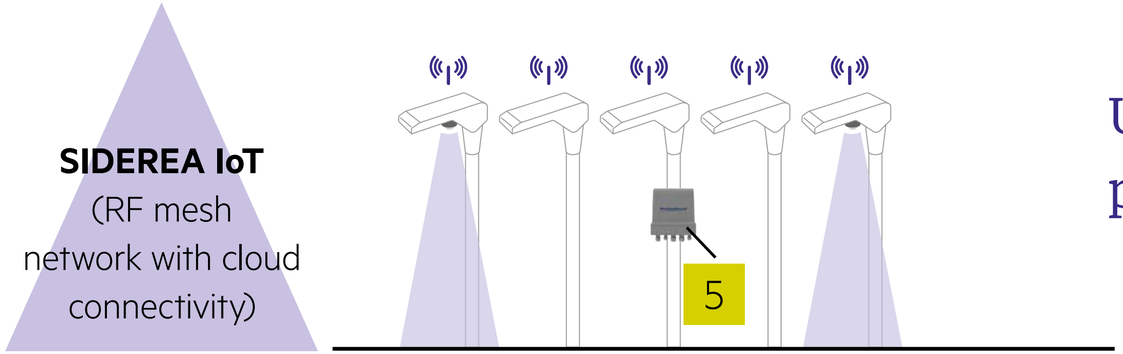
# The three levels of smart outdoor lighting

5

**PE Smart Gateway**

__ Connection to central management systems (CMS), cloud services and Internet of Things (IoT) applications
__ Wireless Iot (IPv6/6LoWPAN) and WiFi integrated network technologies
__ Embedded web interface
__ Simplified installation (embedded antennas, support for pole mounting), rugged enclosure for outdoor environments


**More information >**




Up to 250 luminaires per group

# Overview of components

**Standard for physical interface**

**Standardised communication protocol**









| | Outdoor driver PRE D4i | RF node | RF node with GPS | Motion detector | Light sensor Photocell | Zhaga Socket | group-CONTROL programmer | Gateway |
|---|---|---|---|---|---|---|---|---|
| **SIDEREA IoT** (RF mesh network with cloud connectivity) | ✓ | ✓ | ✓ | ✓ | x | ✓ | x | ✓ |
| **groupCONTROL** (Autonomous RF mesh network) | ✓ | ✓ | ✓ | ✓ | x | ✓ | ✓ | x |
| **sensorMODE** (Standalone luminaire) | ✓ | x | x | ✓ | ✓ | ✓ | x | x |

# SIDEREA sensorMODE

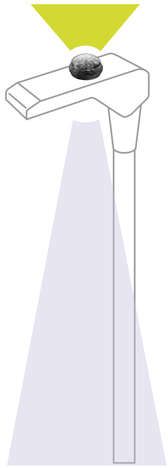
> Dimming of a standalone luminarie based on a light sensor or presence detection or a combination of both

# SIDEREA sensorMODE

Sensor-based *dimming* of individual luminaires

**Advantages**

__ Technology integrated in sensor and driver
__ Option of different dimming profiles:
ambient control, motion control or a combination of both
__ alternatively chronoSTEP function (measuring switch-on and switch-off times of the lighting system) also possible
__ compared to chronoSTEP sensorMODE adds presence and ambient light control
__ compared to corridorFUNCTION sensorMODE adds sunrise/sunset + sequence
__ Detection of separate zones such as footpaths and cycle paths thanks to multi-sensor with two PIR elements



## Standalone luminaire

**Application**

__ Control of a single outdoor luminaire
__ Dim down light level at night to save energy

# SIDEREA sensorMODE

## Sensor-based *dimming* of individual luminaires

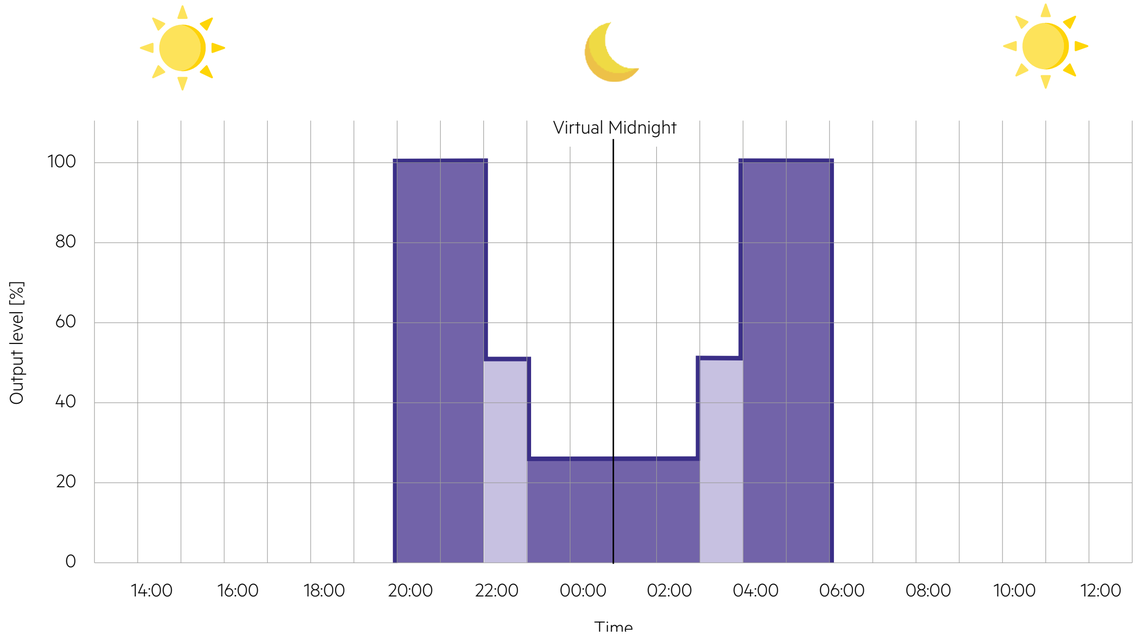
### companionSUITE

**Threshold values & dimming profiles are preset during production in the companionSUITE.**

**4 control modes can be selected**
**Ambient light control:** Brightness information from light sensor to start brightness curve/history
**Motion control:** Pure presence detection
**Ambient light with motion control:** combination of 1 & 2
**Mains with motion control:** Brightness curve/Virtual Midnight via mains, will be temporarily overwritten in case of motion detection

**More information >**

**Example of programmed brightness curve**

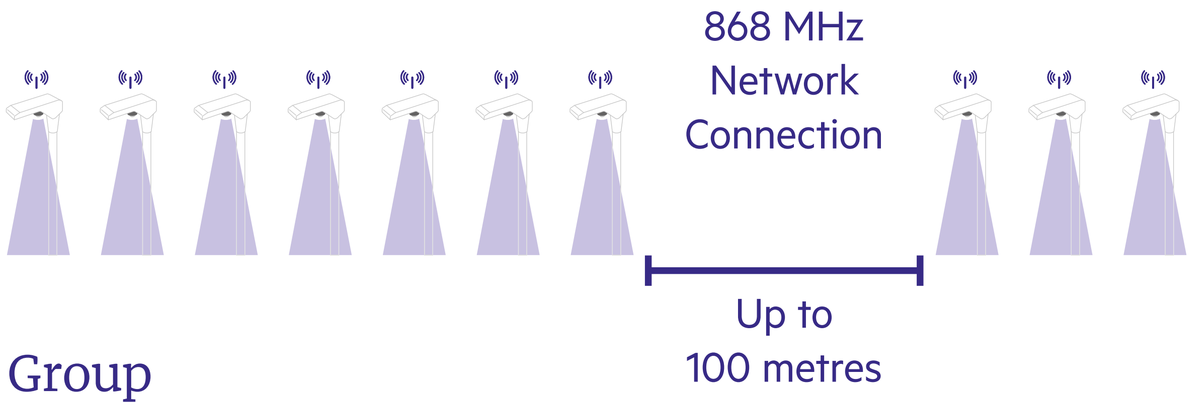


# SIDEREA groupCONTROL

## Local autonomous control of luminaire groups

**Advantages**

— Quick and easy to install and put into operation
— Creation of various scene profiles, via a scheduler, via motion sensors, time-based (sunrise and sunset), via motion path etc.
— Autonomous but networked -> low barrier to entry into networked lighting
— No network or IT experts required
— Seamlessly upgradable to IoT-scale smart city solution
— Withstands harsh outdoor conditions and is equipped with robust network technology




Group

**Application**

— Control of a group of outdoor luminaires based on sensors and time profiles
— Suitable for footpaths and cycle paths, side streets, parks, parking garages, harbours, sports stadiums, logistics centres etc.

# SIDEREA groupCONTROL

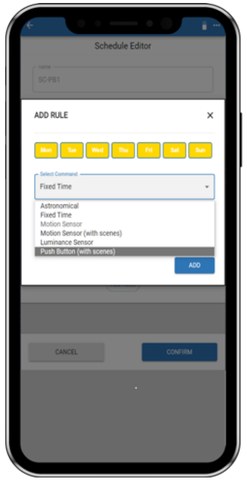
Local autonomous control of luminaire groups

## User Interface

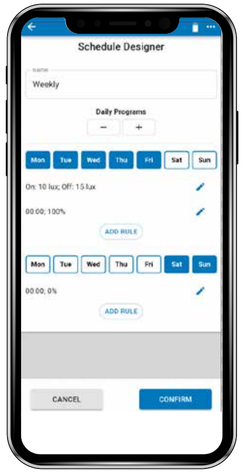
### configTOOL


**RF node** with integrated QR code


**Locate nodes on map**




**Schedule Designer: chose input device**




**Define schedules**

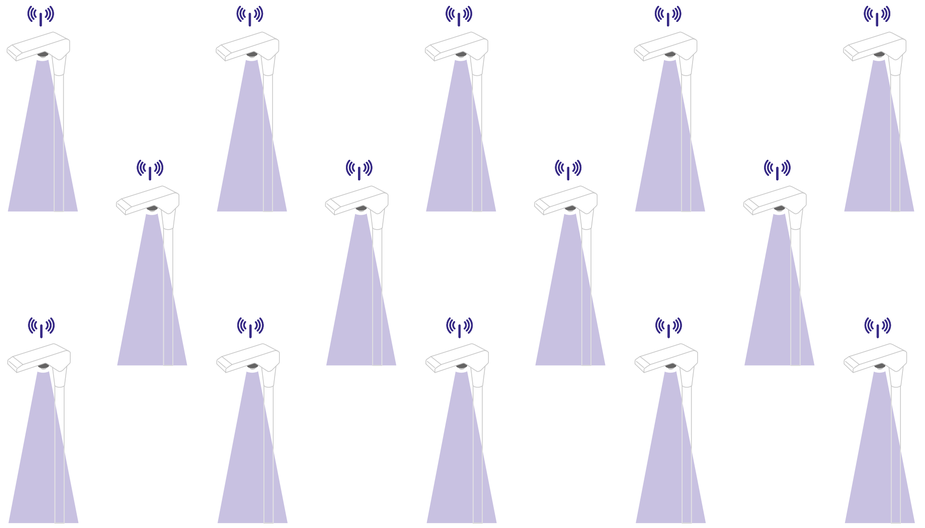
Install the nodes and scan the QR code to automatically locate them on the map.

# SIDEREA Central Management System (CMS) / Internet of Things (IoT)

Fully *integrated solution* based on open standards

**Advantages**

— Open CMS that allows the integration of third-party components
— Seamless integration of customised systems
— Based on uCIFI standards for non-proprietary compatible wireless communication
— The open management platform to manage street lighting and all urban services in a true Smart City perspective



## Any number of luminaires

**Application**

— Integration of outdoor lighting in the municipal central management system for remote management and control

# SIDEREA CMS / IoT

## Overview Fully Integrated Solution

### 1. Intelligent luminaire Components

Luminaires equipped with SIDEREA use the latest standards for control & communication and lay the foundation for a digital city.

### 2. Gateway


The Gateway enables the transmission of data between the luminaire and the central management system (CMS).

### 3. Central management system

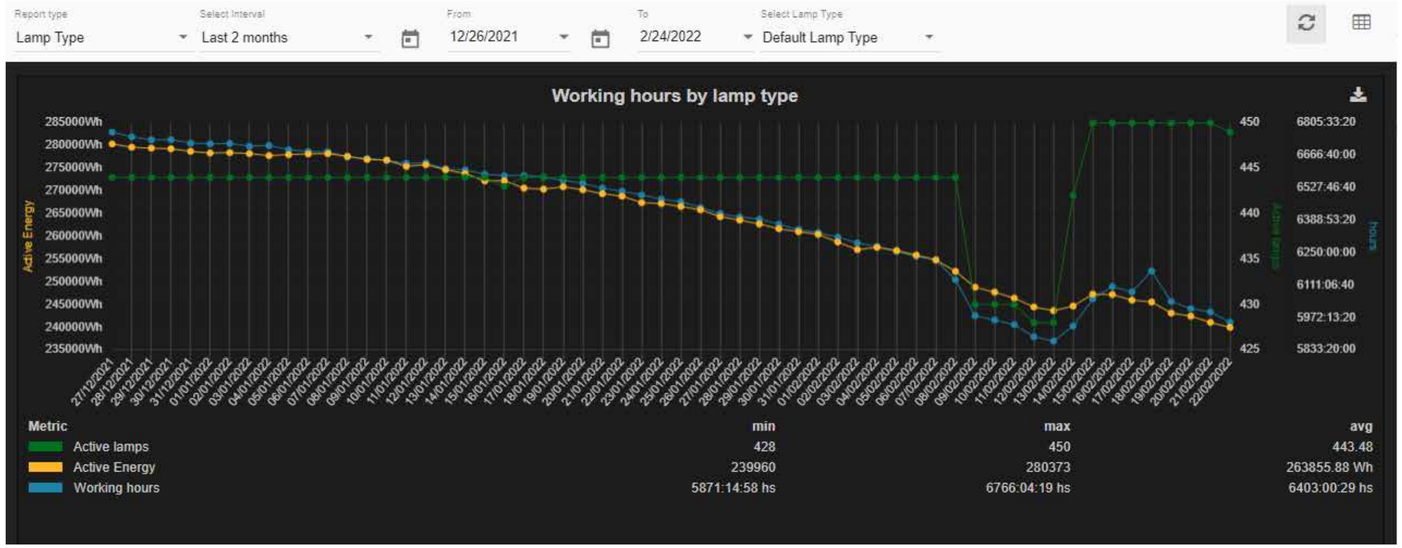
The CMS collects & links the data from all integrated devices.

### 4. Smart city platform

Smart City Platforms enable users to interact with the data and use it to make decisions.

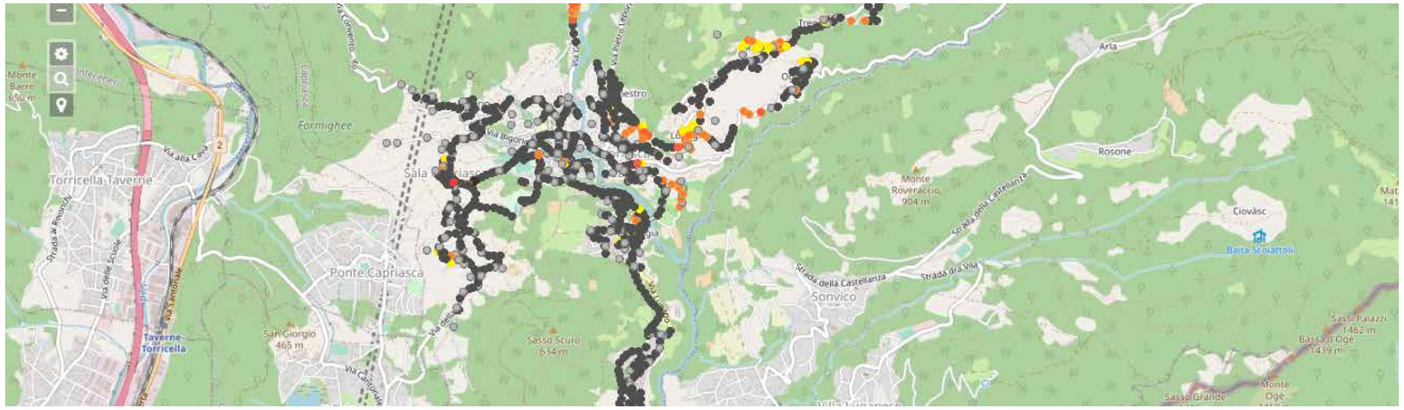
# SIDEREA CMS / IoT

## Data collection, analysis & visualisation




**Energy report**

PE Smart CMS generates customized and actionable reports for single or grouped devices.




**Device control**

PE Smart CMS allows to monitor and control streetlights and any other connected IoT device through intuitive web applications.

# Glossary

**Zhaga:** Global lighting-industry organization that aims to standardize interfaces of components of LED luminaries, including components like LED light engines and LED drivers and many more.

**D4i:** Is the DALI standard for intelligent, IoT-ready luminaires.

**ZD4i:** Is a joint certification program from the DALI Alliance and the Zhaga Consortium. Zhaga-D4i products indicate plug-and-play interoperability of sensors, communication nodes and luminaries.

**IPv6:** Is the most recent version of the Internet Protocol, the communications protocol that provides an identification and location system for computers on networks and routes traffic across the Internet.

**6LoWPAN:** Standard protocol for realizing IPv6 communication on wireless networks: is regarded as one of the preferred protocols to realize the Internet of Things (IoT).

**Internet of things (IoT):** Describes the network of physical objects "things" that are embedded with sensors, software, and other technologies for the purpose of connecting and exchanging data with other devices and systems over the internet.

**PIR sensor:** Passive infrared sensor.

**RF mesh network:** Is a communications network made up of radio nodes organized in a mesh topology.

**uCIFI:** Open unified data model for all smart city devices to provide fully interoperability for all smart city devices.

**TALQ:** Interface standard for smart city device networks.

**chronoSTEP:** Function that measures switch-on and switch-off times of lighting installations to determine virtual midnight for dimming the light level during night hours.

**corridorFUNCTION:** Function that ensures that light is produced only when actually needed. It is built into the control gear and is enabled automatically.

# Smart city video

**Tridonic manufactures system components for luminaires used in the following application areas:**

__ Public parks
__ Urban infrastructure
__ Residential areas
__ Roads, motorways and tunnels
__ Car parks

**More information >**