

LED drivers, modules, controls, overvoltage protection

# **Trusted outdoor solutions**

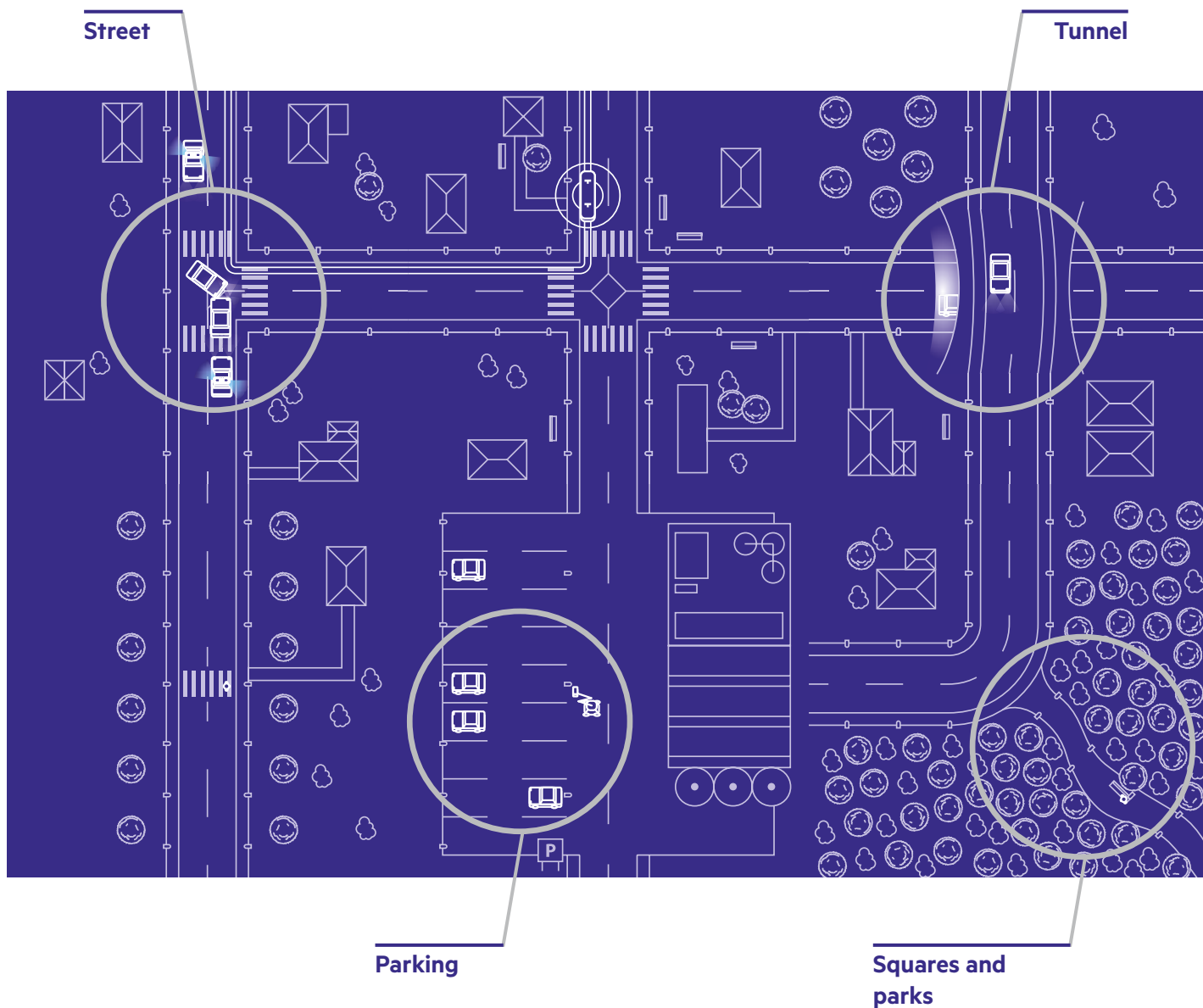
Innovative, efficient, safe



**TRIDONIC**

## Expertise in outdoor lighting

Intelligent added value for the municipal space



### Tridonic – Expertise in outdoor lighting

**In towns, cities and in the country the lighting for roads, bridges and public spaces makes an important contribution to safety and quality of life. Lighting solutions from Tridonic offer the highest quality components meeting the tough requirements of outdoor applications.**

From users perspective, the function of light is to provide optimum illumination of pavements, paths and pedestrian areas therefore offering safety and security. Appropriate lighting levels encourage people to spend time outdoors. For the operator, however, the main focus is on energy efficiency and ease of maintenance, followed by maximum flexibility in configuring the street lighting. LED drivers from Tridonic provide the perfect basis for all these requirements.

# Everything necessary for outdoor lighting

## Portfolio overview



**Tridonic combines quality, safety and efficiency in intelligent LED lighting solutions that impress with low maintenance costs and a high level of reliability. Streets, tunnels, car parks and public places are therefore perfectly lit around the clock.**

Demanding conditions and environmental influences can affect any outdoor lighting system. Thanks to their robustness and reliability, Tridonic's outdoor solutions can easily withstand extreme temperature fluctuations, vibration and humidity and offer comprehensive functionality at all times.

At a glance:

### The benefits of Tridonic products

#### — Innovation

Simple configuration via NFC interface with the Tridonic companionSUITE, ready2mains programmer or U6Me2

#### — Efficiency

Low operating costs thanks to high energy efficiency and durability (special driver functions).

#### — Safety

Protection level thanks to increased dielectric strength (surge/burst) of 10 kV; conform with IEC 61000-4-5 and extended temperature range from -40 to +70 °C

# Innovation

## Technology<sup>+</sup> companionSUITE – Chat with your driver

The Tridonic companionSUITE software collection supports luminaire manufacturers with the generation, transmission and control of driver settings. These include current, corridorFUNCTION, chronoSTEP, Constant Light Output and DC level for emergency lighting. companionSUITE is compatible with commonly used interfaces such as DALI-2 or NFC. Their objective is to optimise processes in the long-term and counteract production errors. During subsequent quality management, Tridonic companionSUITE also makes it easier to analyse and correct potential sources of error.

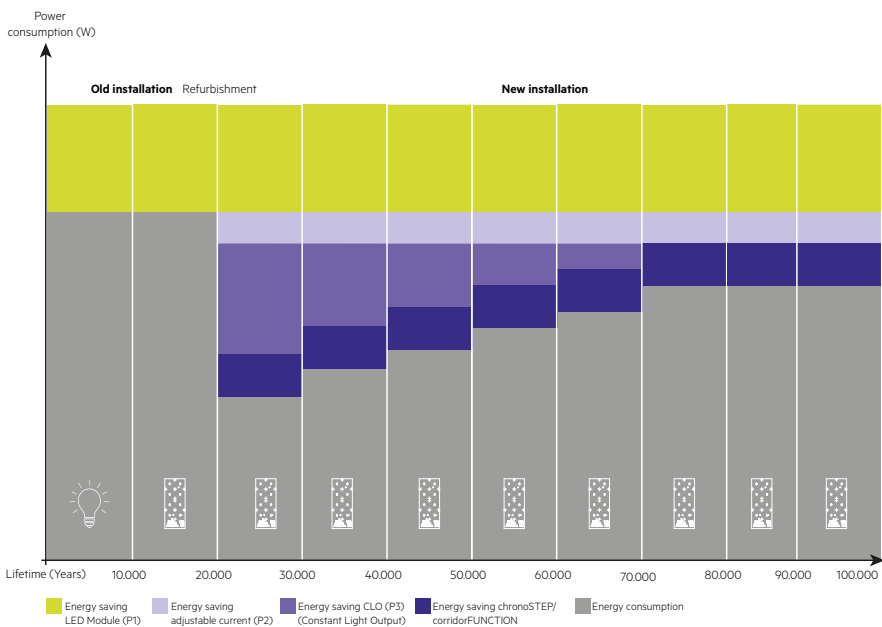




# Configuration via the mains

## The smart way to configure your luminaires

Tridonic’s sophisticated lighting management functions create enormous potential for additional savings. For example, the output current can be adjusted or the light can be movement or time controlled. The enhanced constant light output function (eCLO) also ensures efficient luminaire operation. Whichever function is selected – the level of safety remains unchanged.



**Example**  
90 luminaires each with 125 W high intensity discharge lamps and pole spacings of 50, 45 and 40 metres (every 30 luminaires) consume 55 MWh per year and generate 179 tonnes of CO<sub>2</sub> emissions. To reduce energy consumption, conventional luminaires will initially be replaced by LED luminaires with a 52 W (P1) power input. Based on a maximum life time of 100,000 hours and a cleaning interval of three years, the maintenance factor is 0.8. The additional use of the functions described above results in the following savings per year:

Measure	CO <sub>2</sub> saving	Energy saving
Refurbishment: LED luminaires	12 t	33 MWh
Adjustable current	4 t	11 MWh
CLO function	1.7 t	5 MWh
chronoSTEP	4 t	11 MWh
corridorFunction	3.75 t	10 MWh

Since the savings take effect simultaneously the table values cannot be added. Nevertheless there is an overall reduction in CO<sub>2</sub> of 15.7 t.

### Adjustable current (P2)

Tridonic LED drivers can be individually controlled and easily adjusted. This is particularly advantageous when the light cones of several luminaires overlap, for example at intersections and entrances. Individually adjustable output currents make it possible to reduce the lighting level of the luminaires without great effort.

### Constant Light Output (CLO P3)

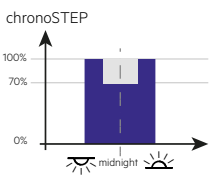
The Constant Light Output function (eCLO) supports efficient operation. It ensures a constant illumination level throughout the life of the luminaire. Initially the LED light sources will not be brighter than required because less current will be supplied to them and they will therefore consume less energy.

### inputDIM

The function makes it possible to dim via the mains voltage. Based on the defined minimum and maximum dimming levels, the corresponding mains voltage is selected within the voltage range of 170 and 250 V AC. If the minimum value defined via inputDIM is higher than the allowed dimming level of the input voltage regulation (IVG+), the value of the IVG+ has priority.

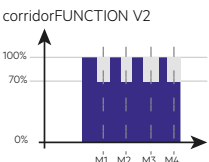
### chronoSTEP (Virtual midnight)

Using the chronoSTEP function, the lighting level can be regulated for certain times of the night. Eight individual dimming levels and day segments can be defined. This allows individual outdoor LED luminaires or entire streets to be programmed as desired from the control cabinet.



### corridorFUNCTION V2

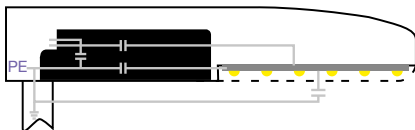
The corridorFUNCTION ensures that high luminous flux is produced only when it is actually needed. As soon as the sensor detects movement the luminous intensity is increased. Once the sensor no longer detects movement the luminous flux can be automatically reduced after a predefined delay.



# Driver for outdoor lighting

## Robust and reliable

Tridonic's innovative outdoor solutions meet the diverse and demanding requirements of outdoor lighting and offer optimum protection. Individual protection classes in the project fulfil all requirements with the protective earth.



### Application Class I

Metal lamp head with protective earth

- All luminaire parts have a proper and defined connection to the protective earth (PE)
- The metal parts of the LED module create a parasitic capacitance to PE



### Application Class II

Metal lamp head with equipotential connection

- Metal lamp head and metal core of the LED PCB are connected to the LED driver via equipotential connector



### Application Class II

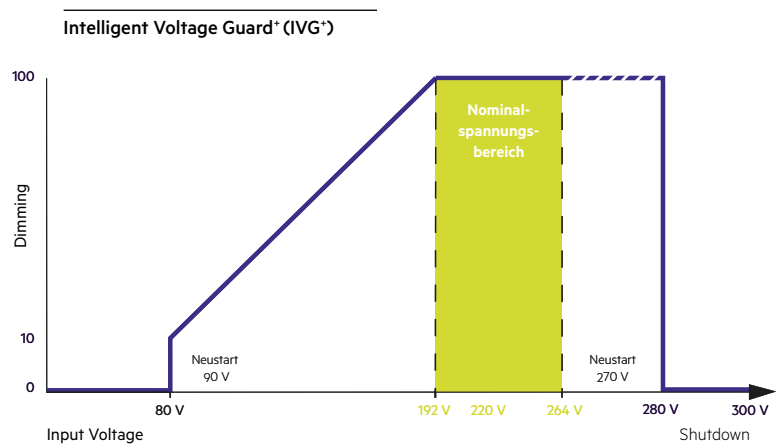
Lamp head with non-conductive materials or no equipotential connection

- All touchable parts of the system are either made of non-conductive materials or insulated according to safety class II



### Intelligent Voltage Guard\* (IVG\*)

If the mains voltage is unstable, voltage surges can occur above or below the rated voltage level. Ideally, the driver should be operated within the range from 192 to 264 Volts. Between 192 and 80 Volts, the LED driver falls into under-voltage and dims to 10 percent. Below 80 Volts, the driver shuts down. This prevents the LED from being overloaded. When the voltage increases to 90 volts again, the driver automatically restarts and dims again linearly. A voltage greater than 280 Volts also results in shut down. When the voltage falls below 270 Volts again, the driver restarts without a reset. If the inputDIM function is also in use, IVG\* has priority.



### External Temperature Monitoring (ETM + NTC)

External Temperature Monitoring (ETM) protects the connected LED against thermal damage. It has three temperature values with which five further reference points can be calculated automatically. These also ensure greater precision of the temperature curve in specific areas. Temperature values within these desired values are interpolated linearly. On the one hand, the temperature sensor (NTC) is defined via the resistance value at 25°C (R25) and, on the other hand, via the sensor constant (BETA).

### Intelligent Temperature Guard (ITG)

The "Intelligent Temperature Guard (ITG)" function provides effective protection against thermal overload. If the predefined temperature is exceeded, the ITG reduces the output power in small two-minute steps. If the temperature falls, the output power is increased again successively in 10-minute cycles. All temperature thresholds of the ITG function fall by the value entered.

# Programmer ready2mains & U6Me2

You can easily configure your LED luminaires with the programmer ready2mains & U6Me2. There is no need for an additional interface as the existing mains interface is used.

Thanks to ready2mains and the use of user-defined configuration scripts, the risk of configuration errors has been significantly reduced. Simple and flexible integration in the municipal infrastructure is also possible.



At a glance:  
**Programmer ready2mains & U6Me2**

- Programming in luminaire production or test environments
- Suitable for the use in streets and switching cabinets
- Up to 500 scripts can be stored (ready2mains, U6Me2 and DALI scripts)
- Supporting software for fast programming
- Integrated USB interface for programming via DALI, ready2mains and U6me2
- Current can be set in 1mA steps (ready2mains and DALI)

Type	Size	Order No.
Programmer ready2mains U6Me2	173 x 87 x 47 mm	28001206

### Parameters

Feature	ready2mains	U6Me2
Distance	Short (~400 m)	Long (~1.5 km)
No. of devices programmable in parallel	5 LED drivers (max 400 VA)	No limit
Programming options	Current, CLO, chronoSTEP*, corridorFUNCTION	chronoSTEP*
Programming speed	Fast	Slow
Dimming	Yes	No
Best application	Flexible on-site and at the factory	Outdoors at the cabinet

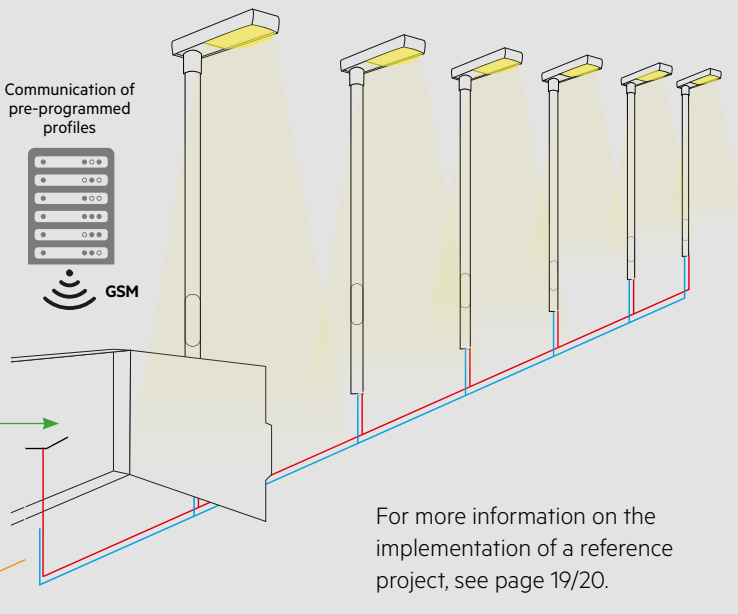
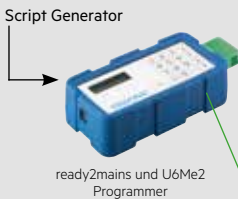
\* Autonomous midnight-settings

### Did you know

#### Centralised telecontrol-system via U6Me2 technology

Remote control system that brings smart and connected lighting functionality based on U6Me2

- Remote configuration of chronoSTEP 2 and enhanced constant light output (eCLO)
- Cost efficient and quick programming of a whole street or a single pole via a connected cabinet and U6Me2
- Utilizes existing network/infrastructure



For more information on the implementation of a reference project, see page 19/20.

# Surge protection device (SPD)

## Protection against overvoltage



At a glance:  
**Surge protection device (SPD) SNC EU**

- IP20 For luminaires with protection class II
- Protection up to 10 kV L-N (IEC 61643-11)
- Universal use for street, tunnel or object lighting
- Flexible installation, fixed via integrated elongated holes
- Compact design
- Optical status indicator
- Double or reinforced insulation
- Type of protection IP20
- 5-year guarantee

Type	Size	Order No.
SPD 10kV CE SNC	56 x 36,5 x 34 mm	28002383

Fitted to the luminaire head or pole, the surge protection device prevents a luminaire being damaged at an overvoltage up to 10 kV. In the event of a lightning strike, for example, the surge protection device (SPD) may be damaged itself, but the lighting remains functional.



# Surge protection device (SPD)

## Protection against overvoltage



At a glance:  
**Surge protection device (SPD) Class I**

- SPD with additional earth conductor for country-specific requirements
- For luminaires with protection class II
- Protection up to 10 kV L-N (IEC 61643-11)
- Universal application in street, tunnel or building lighting
- Flexible installation, mounting via integrated long holes
- Compact design
- Optical status display
- Doubled/reinforced insulation
- Degree of protection IP20
- 5-year guarantee

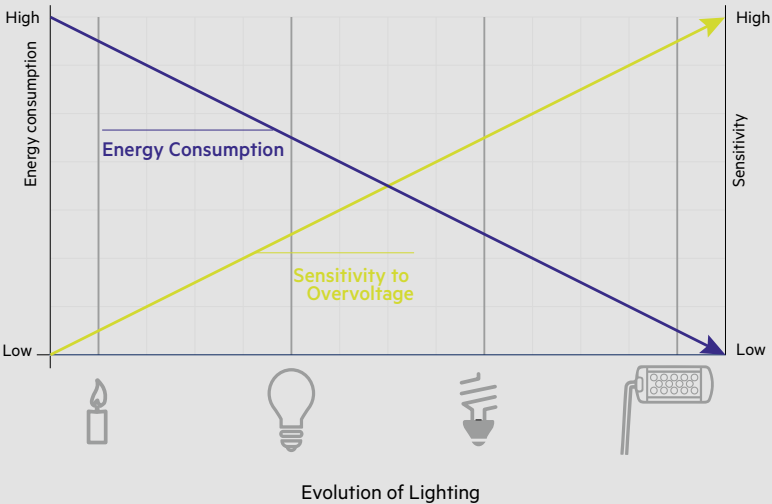
Type	Size	Order No.
SPD 10kV PC1 CE SNC	56 x 36,5 x 34 mm	28003023

### Did you know

LED luminaires are becoming increasingly energy-efficient. At the same time however, their sensitivity to overvoltage is also increasing. An overvoltage protection device is advisable for several reasons:

#### Why use a surge protection device:

- 1. Extend the life time of LED luminaires**  
Compared with conventional lighting solutions, the electronic components of LED luminaires react more sensitively to transients.
- 2. Avoid unexpected costs**  
Identifying a damaged component on site involves a great deal of effort. Therefore, in most cases the entire luminaire head is replaced. Errors of this kind are costly and should be avoided from the outset.
- 3. Improve light availability in safety-relevant areas**



# Ready for the future

## Functions for smart outdoor solutions

With the premium (PRE3) driver, cities and municipalities can equip themselves for the digital future, today. In addition to the connection option for IoT devices, it is the first D4i-ready driver worldwide to meet the latest DALI standards, which define the provision of devices, vital data and consumption data of the drivers. In combination with RF node, PIR sensor and Zhaga socket, Tridonic presents a future-proof outdoor solution that can be used to implement a wide range of digital and IoT concepts.

### One of the best thermal management

From -40 °C to +65 °C

### DALI D4i IoT interface

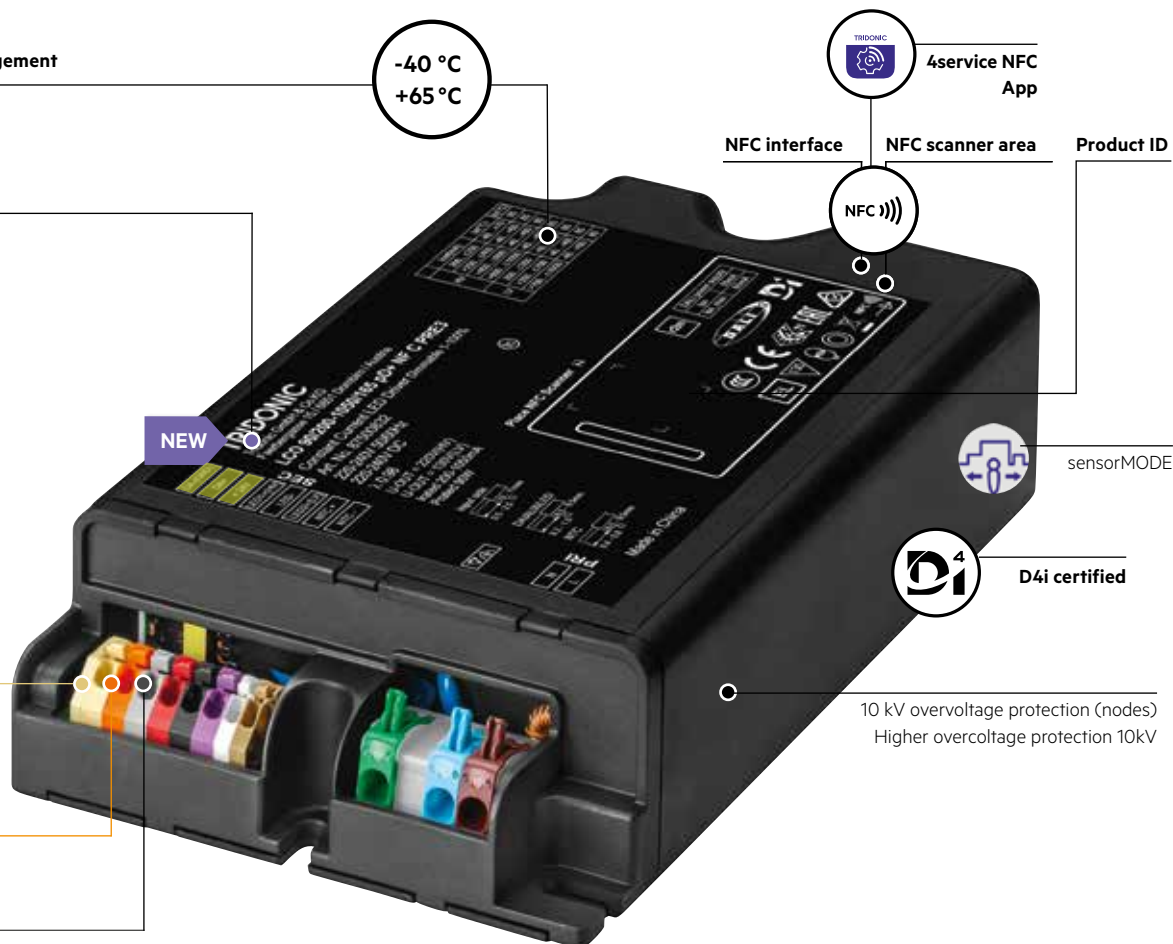
### DALI bus power supply(+)

DALI part 250

### AUX 24 V power supply

### DALI bus power supply (-)

DALI part 250



More information about LED drivers  
OUTDOOR compact dimming



NEW	Type	Output current (mA)	Output power <sup>1)</sup> (W)	Output voltage range <sup>1)</sup> (V)	Input voltage (V)	Size (mm)	Order No.
	LCO 14/100-550/38 D4i+ NF C PRE3	100-550	14	28-38	220-240	123 x 77 x 31	87500828
	LCO 24/200-1050/39 D4i+ NF C PRE3	200-1,050	24	28-38	220-240	123 x 77 x 31	87500829
	LCO 40/200-1050/64 D4i+ NF C PRE3	200-1,050	40	38.1-64	220-240	123 x 77 x 31	87500830
	LCO 60/200-1050/100 D4i+ NF C PRE3	200-1,050	60	57.1-100	220-240	133 x 77 x 31	87500831
	LCO 90/200-1050/165 D4i+ NF C PRE3*	200-1,050	90	85.7-165	220-240	150 x 90 x 37.5	87500832
	LCO 135/200-1050/220 D4i+ NF C PRE3*	200-1,050	135	128.6-220	220-240	150 x 90 x 37.5	87500833
	LCO 200/200-1050/355 D4i+ NF C PRE3*	200-1,050	200	190.5-355	220-240	170 x 100 x 40	87500834

<sup>1)</sup> Depending on the selected output current; Further details can be found in datasheet

# Driver premium Series (PRE) generation 3

## D4i ready with IoT connection



Driver 14/24/40/60/90/135/200 W PRE3

At a glance:

### NFC interface

#### Innovative

- Standardized supply for the 24 V AUX- and DALI Supply

#### Safe

- Currentless and contactless programming

#### Flexible & fast

- NFC multiprogramming with companionSUITE software: simultaneous programming of up to 20 packaging units
- Interface for a field reader to later use the 4ServiceAPP

#### Reliable

- -40 °C to +65 °C
- Transient protection 10 kV (SKI) up to 6 kV (SKII)

### Interfaces

- Integrated DALI power supply
- 24 V auxiliary power supply (Book 250)
- NTC
- DALI-2
- ready2mains™, U6Me2, NFC

### Big operating window

- Wide, effective operating window
- Optimised inventory management and improved efficiency

### 24 V auxiliary power supply

- AUX 24 V – integrated DALI power supply
- Supports ideal operation of communication modules and sensors. Sensors and basicDIM Wireless (Casambi-ready) modules

### Did you know

**DIIA and Zhaga is standardising control device communication, irrespective of manufacturer.**

SIDEREA



Control devices can not only receive group and address functions, but also send them. DALI-2 takes this fact into account and enables several control devices to be connected to one bus. Certified products can be easily replaced by others, and the manufacturer can be chosen as required. Another advantage is that sensors obtain their power directly from the DALI line and do not require an additional power supply from batteries.



**With D4i, the new DALI standard for the Internet of Things (IoT), the Digital Illumination Interface Alliance (DiIA) is defining a new standard for the DALI bus within the luminaire.**

The connection of LED drivers to other DALI-2 control modules is regulated in two core areas. Firstly, D4i defines how data is saved, transported and processed in DALI-2 drivers. Secondly, it determines how a driver with an integrated DALI bus connection can supply other devices with power. The AUX 24 V power supply has also been standardised for control devices with higher electricity requirements (wireless).

### The specifications at a glance

- DALI Part 250: Integrated bus power supply
- DALI Part 251: Memory bank extension for luminaire-related data
- DALI Part 252: Energy reporting
- DALI Part 253: Diagnostics & maintenance
- 24 V AUX power supply

# RF node and Zhaga socket



At a glance:  
**RF node and Zhaga socket**

- Based on Zhaga Book 18 Ed. 2.0 interface with paradox IPv6 6LoWPAN mesh technology (868 MHz)
- Full self-healing mesh network and unicast (data transfer from luminaire to luminaire) for light-on-demand function
- DALI multi-master controller for controlling several DALI-2 LED devices
- Designed for the IP-based monitoring and control of luminaires according to Zhaga-D4i standard
- 24 V auxiliary power supply (Book xx) and integrated DALI power supply
- Supports the operation of communication modules and sensors.
- Zhaga-certified interface according to Zhaga Book 18 Ed. 1
- Designed for harsh environments with life time of up to 100,000 hours (at tc = 72 °C)
- Degree of protection IP66 and impact resistance IK09

Type	Size (mm)	Order No.
CIS 30 RF868 DA2	79,7 x 38,5	28002647
Zhaga-Socket*	Zhaga book 18	28002647

Compatible with the DALI specifications book 250-253, the radio communication module supports the latest standards for improved control functions and the monitoring of various categories of luminaire data on energy, diagnostics and maintenance. Several RF nodes build their own mesh network, allowing them to bridge distances of up to 100 metres. Six connection points between node and paradox gateway allow interaction with up to 300 nodes per network. A real-time clock also supports accurate dimming, which can be conveniently controlled remotely via the central control platform. Thanks to the innovative interface, which complies with the latest Zhaga standard Book 18 Ed. 2.0, the node can be mounted without tools via plug-and-play.

# Sensor PCell SSI 31 PC DA2 SA



At a glance:

**Sensor PCell SSI 31 PC DA2 SA**

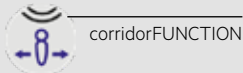
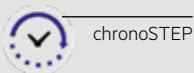
- Photocell sensor with ambient light detection
- Detection angle: 150°
- Designed for harsh outdoor conditions: IP66, IK09
- Life time up to 100,000 hours at tc 60°
- Low energy consumption of max. 0.23 W

Type	Size (mm)	Order No.
PCell SSI 31 PC DA2 SA	ø 12	28003310

The ambient light detection sensor has a detection range of up to 150 degrees and functions even in very harsh conditions. The integrated sensorMODE function, in combination with Tridonic OUT drivers, offers a simple, cost-effective solution for creating and saving dimming profiles in individual street lights, without a network connection. Everything required to do this is installed along with the sensor in the luminaire itself. Complex programming is also not required. The dimming profiles are set using the corridorFUNCTION during production but can also be uploaded, adapted and confirmed directly via a status LED at a later date using the 4service NFC app. With Zhaga Book 18 and DALI-2, the sensor also meets key standards for convenient handling and installation.

**Did you know**

**sensorMODE**



Tridonic's sensorMODE offers an easy way to control outdoor luminaires. Integrated in the sensor and driver, sensorMODE is used to create different dimming profiles. Four control modes, which use motion and ambient light either individually or in combination to control the light, can be selected as required and depending on the sensor. Tridonic's sensor portfolio has something for every application. Threshold values and dimming profiles are preset during production by the sensorMODE wizard in the companionSUITE. Settings can also be changed on site using the 4service NFC app. The result? Cost-effective intelligent solutions for individual light points, with few components and which reduce energy consumption and increase safety for road users.



**Four control modes:**

- Ambient light control
- Motion control
- Ambient light and motion
- Mains with motion control



# PIR sensor



Street light motion sensor

+



At a glance:

**PSensor SSI 31 2xPIR 8DP DG**

- 2 x PIR multisensor for motion and ambient light detection
- Mid-bay sensor for heights up to 8 metres
- 2 x PIR sensor
- Easy and flexible installation thanks to Zhaga Book 18 Ed. 1.2-certified interface
- Rectangular/asymmetric detection range of up to 16 m
- Mains overvoltage protection up to 10 kV in combination with the PRE driver
- Degree of protection IP66

Type	Size	Order no.
PSensor SSI 31 2xPIR 8DP DG	ø 79,7 x 52,8 mm	28002642

The D4i certified multisensor has been specially designed for outdoor lighting. Equipped with two PIR elements, the sensor has a very wide detection range of 156 to 560 m², enabling detection of objects with lateral orientation.

In addition to conventional roads, two different zones, such as pavements and cycle paths, can also be detected and illuminated separately. Thanks to an integrated temperature measurement function, the sensor also measures the ambient temperature of the luminaire, enabling detailed heatmaps to be created and evaluated.

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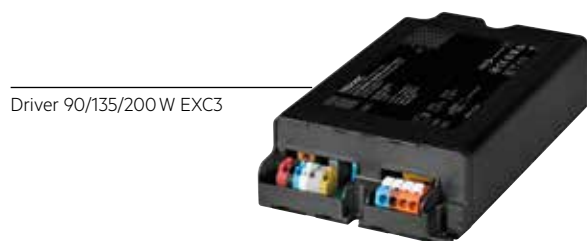
Trusted outdoor solutions

# Driver excite serie (EXC3) generation 3

## DALI-dimmable, flexible



Driver 14/24/40/60 W EXC3



Driver 90/135/200 W EXC3

At a glance:

### Driver EXC3

- Dimmable built-in constant current LED Driver
- Output current adjustable between 200 – 1.050 mA via NFC\*, DALI or ready2mains Programmer
- Nominal life-time of 100,000 h and 8-year guarantee

### Innovative:

- Flexible configuration via DALI, ready2mains, U6Me2
- In-field programming possible after installation with NFC interface\* and ready2mains

### Safe:

- High overvoltage protection: up to 10 kV asymmetric (protection class I und II)
- Protective features (overtemperature, short-circuit, overload, no-load, input voltage range, reduced surge amplification)
- For luminaires of protection class I and protection class II

### Efficient:

- Dimming area 5 – 100 % (min. 5 mA)
- Dimming through mains voltage (inputDIM)

Type	Output current (mA)	Output power <sup>1)</sup> (W)	Output voltage range <sup>1)</sup> (V) <sup>1)</sup>	Input voltage (V)	Size (mm)	Order No
<b>Made in Europe</b>						
LCO 14/100-500/38 o4a NF C EXC3	100-500	14	28-38	220-240	105 x 70 x 31	28003165
LCO 24/200-1050/38 o4a NF C EXC3	200-1,050	24	28-38	220-240	123 x 77 x 31	28003166
LCO 40/200-1050/64 o4a NF C EXC3	200-1,050	40	38-64	220-240	123 x 77 x 31	28003160
LCO 40/200-1050/64 o4a NF C EXC3	200-1,050	40	38-64	220-240	123 x 77 x 31	28003167
LCO 60/200-1050/100 o4a NF C EXC3	200-1,050	60	57-100	220-240	133 x 77 x 31	28003168
LCO 60/200-1050/100 o4a NF C EXC3	200-1,050	60	57-100	220-240	133 x 77 x 31	28003161
LCO 90/200-1050/165 o4a NF C EXC3	200-1,050	90	88-165	220-240	133 x 77 x 31	28003162
LCO 135/200-1050/220 o4a NF C EXC3	200-1,050	135	129-220	220-240	150 x 90 x 38	28003163
LCO 200/200-1050/355 o4a NF C EXC3	200-1,050	200	191-355	220-240	170 x 100 x 40	28003164
<b>Made in China</b>						
LCO 14/100-500/38 o4a NF C EXC3	100-500	14	28-38	220-240	105 x 70 x 31	87500707
LCO 24/200-1050/38 o4a NF C EXC3	200-1,050	24	28-38	220-240	123 x 77 x 31	87500708
LCO 40/200-1050/64 o4a NF C EXC3	200-1,050	40	38-64	220-240	123 x 77 x 31	87500709
LCO 60/200-1050/100 o4a NF C EXC3	200-1,050	60	57-100	220-240	133 x 77 x 31	87500710
LCO 90/200-1050/165 o4a NF C EXC3	200-1,050	90	88-165	220-240	133 x 77 x 34	87500717
LCO 135/200-1050/220 o4a NF C EXC3	200-1,050	135	129-220	220-240	150 x 90 x 38	87500716
LCO 200/200-1050/355 o4a NF C EXC3	200-1,050	200	191-355	220-240	170 x 100 x 40	87500711

<sup>1)</sup> Depending on the set output current, Further details can be found in our data sheet



# Driver advanced series (ADV3) generation 3

Dimmable, configurable



Driver 14/24/40/60 W ADV3



Driver 90/135/200 W ADV3

At a glance:

## Driver ADV3

- Dimmable built-in constant current LED Driver
- Output current adjustable between 200–1,050 mA via NFC and ready2mains programmer
- Lifetime of up to 100,000 hours and 8-year guarantee

## Innovative:

- Flexible configuration via ready2mains, U6Me2 and NFC
- In-field programming possible after installation with ready2mains and NFC interface
- High overvoltage protection: 10 kV

## Efficient:

- Dimming range 5–100 %
- Dimming through mains voltage (inputDIM)

## Safe:

- For luminaires of protection class I and II
- High overvoltage protection: up to 10 kV asymmetric (protection class I and II)
- Protective functions (overttemperature, short circuit, overload, idling, input voltage range, reduced surge current amplification)

Type	Output current (mA)	Output power <sup>1)</sup> (W)	Output voltage range <sup>1)</sup> (V)	Input voltage (V)	Size (mm)	Order No
LCO 14/100-500/38 NF C ADV3	100–500	14	28–38	220–240	105 x 70 x 31	87500821
LCO 24/200-1050/39 NF C ADV3	200–1,050	24	28–38	220–240	123 x 77 x 31	87500822
LCO 40/200-1050/64 NF C ADV3	200–1,050	40	38.1–64	220–240	123 x 77 x 31	87500823
LCO 60/200-1050/100 NF C ADV3	200–1,050	60	57.1–100	220–240	133 x 77 x 31	87500824
LCO 90/200-1050/165 o4a NF C ADV3	200–1,050	90	85.7–165	220–240	133 x 77 x 34	87500825
LCO 135/200-1050/220 o4a NF C ADV3	200–1,050	135	128.6–220	220–240	150 x 90 x 37	87500826
LCO 200/200-1050/355 o4a NF C ADV3	200–1,050	200	190.5–355	220–240	170 x 100 x 40	87500827

<sup>1)</sup> Depending on the selected output current; Further details can be found in datasheet

## Did you know

**Tridonic drivers have overvoltage protection up to 10 kV and meet protection classes I and II in accordance with standard IEC 61000-4-5.**



When protecting against overvoltage, the place at which it occurs is crucial. For example, lightning results in overvoltage between the current-carrying mains lines and the ground. In this case, LED drivers from Tridonic offer protection up to 10 kV – including

for the LED module. If the distance between the lightning strike and the pole is 150 metres or more, the LED module remains undamaged. PRE outdoor drivers protect 5 out of 10 luminaires. By comparison: Protection up to 6 kV only protects one out of 10 luminaires against damage. Thus, with the PRE outdoor driver series, maintenance costs can be saved, as significantly fewer luminaires have to be repaired or completely replaced.

# Driver

## Product overview

### Product portfolio – Overview

Benefit	Function	essence (SNC)	advanced (ADV)	excite (EXC)	premium (PRE)
		<b>Cost-effective</b> Fixed Output, IP67	<b>Simplicity itself</b> NFC programming, IP20	<b>Flexible</b> DALI connectivity, NFC programming, IP20	<b>Convenient</b> powered DALI, Sensor-ready, Data-logging, AUX, IP20
	Power	75, 100, 150, 200 W		14, 24, 40, 60, 90, 135, 200 W	
	Lifetime/ Guarantee	50.000 h/5 yrs		100.000 h/8 yrs	
<b>Innovative</b> 	AUX LVPS 24 V				✓
	pDALI (DT49)				✓
	DALI-2/one4all			✓	✓
	NFC		✓	✓	✓
	ready2mains / U6Me2		✓	✓	✓
<b>Efficient</b> 	corridorFUNCTION V2			✓	
	chronoSTEP 2 (Virtual Midnight)		✓	✓	✓
	inputDIM		✓	✓	✓
	eCLO**		✓	✓	✓
<b>Safe</b> 	ETM*, NTC			✓	✓
	ITM***	✓	✓	✓	✓
	IVG+ (Intelligent Voltage Guard Plus)		✓	✓	✓
	Transient protection	6 kV	10kV	10kV	10kV
	ta range	-30 °C to +60 °C	-40 °C to +70 °C	-40 °C to +70 °C	-40 °C to +70 °C

\*External temperature management; \*\*Anticipated constant light output; \*\*\*Internal temperature management

Trusted outdoor solutions

## RLE 2<sup>nd</sup> generation modules

Efficient, innovative, versatile



At a glance:

### Module RLE ADV/EXC 2<sup>nd</sup> generation

- High efficiency outdoor modules
- Small luminous flux tolerances
- Suitable for harsh and humid outdoor conditions tested acc. to salt spray test (IEC 60068-2-52) and harmful gas test (GR-1217-CORE)
- Surge tested 6 kV with Tridonic LED Driver
- Push-in terminals for simple and quick wiring

**The new RLE module generation is designed for modular and versatile luminaire designs. It provides an ideal basis for exceptional lighting solutions in outdoor areas and industrial applications.**

Versatility, efficiency and safety – the second generation of RLE modules combines three of the Tridonic outdoor portfolio's fundamental values in a completely new way. The long life time of 100,000 hours (High-Power LineUp modules) and 80,000 hours (Mid-Power modules) has been established under harsh conditions and in numerous tests

such as salt spray or pollutant tests. The extended temperature range from -40°C to +105°C ensures perfect operation even under the harshest climatic conditions. Combined with Tridonic outdoor drivers, the RLE modules can easily withstand voltages of up to 6 kV. The Mid-Power modules boast industry-leading efficiency of up to 190 lumens per watt, thanks to the latest LED technology. Designed according to Zhaga standards, the entire module generation is compatible with numerous lenses such as LEDiL Strada 2x2, IP-2x6 and Stradella 16.



# Module RLE excite series (EXC2) generation 2

## High power



At a glance:

### Module RLE EXC2 High Power

- Life time of 100,000 hours and 8-year guarantee
- Broad temperature range from -40 to +105°C
- CRI > 70 for high efficiency and CRI > 80 for perfect colour rendering
- Luminous flux: 2,000 lm, 3,000 lm, 4,000 lm

At a glance:

### RLE EXC2 2x4 and RLE EXC2 2x8

**Efficient:** Efficacy of up to 175 lm/W

**Safe:** Integrated NTC for overtemperature protection

**Versatile:** Zhaga Book 15 compliant (2x4, 2x8) and Zhaga Book 19 (2x6); for use with standard 2x2 lenses

At a glance:

### RLE EXC2 2x6

**Efficient:** Efficacy of up to 155 lm/W

**Versatile:** For use with IP6x lenses

(e.g. LEDIL Strada IP-2X6)

### Module RLE EXC2 OTD high power

Type	Colour temperature (K)	Mac Adam	Typ. luminous flux <sup>o</sup> (lm)	CRI	Typ. power consumption <sup>o</sup> (W)	Module efficacy <sup>o</sup> tp = 75°C (lm/W)	Size (mm)	Order No.
RLE 2x4 2000lm 827 HP EXC2 OTD	2,700	SDCM 5	2,020	>80	14.6	up to 139	121.4 x 49.5	89603156
RLE 2x4 2000lm 830 HP EXC2 OTD	3,000		2,220			up to 153		89603157
RLE 2x4 2000lm 840 HP EXC2 OTD	4,000		2,300			up to 158		89603158
RLE 2x4 2000lm 850 HP EXC2 OTD	5,000		2,320	up to 159	89603160			
RLE 2x4 2000lm 730 HP EXC2 OTD	3,000		2,050	up to 167	89603432			
RLE 2x4 2000lm 740 HP EXC2 OTD	4,000		2,190	up to 179	89603433			
RLE 2x6 3000lm 830 HP EXC2 OTD	3,000	SDCM 5	3,540	>80	23.6	up to 150	146 x 45	89603167
RLE 2x6 3000lm 840 HP EXC2 OTD	4,000		3,670			up to 155		89603168
RLE 2x6 3000lm 850 HP EXC2 OTD	5,000		3,300			up to 145		89603169
RLE 2x8 4000lm 827 HP EXC2 OTD	2,700	SDCM 5	4,040	>80	29.1	up to 139	223 x 49.5	89603161
RLE 2x8 4000lm 830 HP EXC2 OTD	3,000		4,440			up to 153		89603162
RLE 2x8 4000lm 840 HP EXC2 OTD	4,000		4,120			up to 141		89603163
RLE 2x8 4000lm 850 HP EXC2 OTD	5,000		4,640	up to 159	89603164			
RLE 2x8 4000lm 730 HP EXC2 OTD	3,000		4,090	up to 167	89603434			
RLE 2x8 4000lm 740 HP EXC2 OTD	4,000		4,340	up to 177	89603165			
RLE 2x8 4000lm 757 HP EXC2 OTD	5,700		4,350	up to 178	89603435			
RLE 2x8 4000lm 765 HP EXC2 OTD	6,500		4,100	up to 168	89603166			

<sup>1)</sup> Tolerance range for electrical and optical data: ±10 %; NM tp bei 75 °C



# Modules RLE AMB excite Series (EXC2), generation 2

## Safe, environmentally friendly and decorative



At a glance:

### Modul RLE AMB EXC2

- Outdoor modules with amber light colour (1800 K)
- Better visibility in fog due to reduced glare
- Ideal for harbour or coastal lighting as well as roads in mountainous areas and conflict zones
- such as pedestrian crossings
- Insect-friendly light spectrum
- Decorative lighting in old town or star parks
- Wide temperature range from -40 to +100 °C
- Lifetime of 100,000 hours
- 8 year guarantee

### Module RLE EXC2 OTD high power

Type	Colour temperature (K)	Mac Adam	Typ. luminous flux <sup>1)</sup> (lm)	CRI	Typ. power consumption <sup>1)</sup> (W)	Moduleeffizienz <sup>1)</sup> tp = 75°C (lm/W)	Size (mm)	Order No.
RLE 2x4 2000lm AMB HP EXC2 OTD	1.800	—	1.750	>80	14,6	bis zu 108	121,4 x 49,5	28003869
RLE 2x4 2000lm 827 HP EXC2 OTD	2.700	SDCM 5	2.020			bis zu 139		89603156
RLE 2x4 2000lm 830 HP EXC2 OTD	3.000		2.220			bis zu 153		89603157
RLE 2x4 2000lm 840 HP EXC2 OTD	4.000		2.300			bis zu 158		89603158
RLE 2x4 2000lm 850 HP EXC2 OTD	5.000		2.320			bis zu 159		89603160
RLE 2x4 2000lm 722 HP EXC2 OTD	2.200		1.740	>70	12,3	bis zu 142		28003706
RLE 2x4 2000lm 730 HP EXC2 OTD	3.000		2.050			bis zu 167		89603432
RLE 2x4 2000lm 740 HP EXC2 OTD	4.000		2.190			bis zu 179		89603433
RLE 2x4 2000lm 765 HP EXC2 OTD	6.500		2.190			bis zu 179		28003707
RLE 2x6 3000lm 830 HP EXC2 OTD	3.000	SDCM 5	3.540	>80	23,6	bis zu 150	146 x 45	89603167
RLE 2x6 3000lm 840 HP EXC2 OTD	4.000		3.670			bis zu 155		89603168
RLE 2x6 3000lm 850 HP EXC2 OTD	5.000		3.300			bis zu 157		89603169
RLE 2x8 4000lm AMB HP EXC2 OTD	1.800	—	3.500	>80	29,1	bis zu 108	223 x 49,5	28003870
RLE 2x8 4000lm 827 HP EXC2 OTD	2.700	SDCM 5	4.040			bis zu 139		89603161
RLE 2x8 4000lm 830 HP EXC2 OTD	3.000		4.440			bis zu 153		89603162
RLE 2x8 4000lm 840 HP EXC2 OTD	4.000		4.120			bis zu 141		89603163
RLE 2x8 4000lm 850 HP EXC2 OTD	5.000		4.640			bis zu 159		89603164
RLE 2x8 4000lm 722 HP EXC2 OTD	2.200		3.470	>70	24,5	bis zu 142		28003708
RLE 2x8 4000lm 730 HP EXC2 OTD	3.000		4.090			bis zu 167		89603434
RLE 2x8 4000lm 740 HP EXC2 OTD	4.000		4.340			bis zu 177		89603165
RLE 2x8 4000lm 757 HP EXC2 OTD	5.700		4.350			bis zu 178		89603435
RLE 2x8 4000lm 765 HP EXC2 OTD	6.500		4.100			bis zu 168		89603166

<sup>1)</sup> Tolerance range for electrical and optical data: ±10 %; NM tp bei 75 °C



# Module RLE advanced series (ADV)

## Mid power



At a glance:

**Module RLE ADV2 mid power**

- Lifetime of 80,000 hours
- Increased temperature range from -40 to +95 °C
- CRI > 80
- Luminous flux: 2,000 lm/4,000 lm
- 5-year guarantee

**Efficient:**

- Efficacy of up to 190 lm/W

**Versatile:**

- For use with x16 lenses (e.g. LEDIL Stradella 16)

**Safe:**

- Integrated NTC for overtemperature protection

Type	Colour temperature (K)	Mac Adam	Typ. luminous flux <sup>1)</sup> (lm)	CRI	Typ. power consumption <sup>1)</sup> (W)	Module efficacy <sup>1)</sup> tp = 75 °C (lm/W)	Size (mm)	Order No.
RLE 4x8 2000lm 827 MP ADV2 OTD	2.700	SDCM 3	1.970	80	11,1	up to 179	121,4 x 49,5	28003053
RLE 4x8 2000lm 830 MP ADV2 OTD	3.000		2.020			up to 182		89603170
RLE 4x8 2000lm 840 MP ADV2 OTD	4.000		2.080			up to 187		89603171
RLE 4x8 2000lm 850 MP ADV2 OTD	5.000		2.110			up to 190		89603172
RLE 4x8 2000lm 865 MP ADV2 OTD	6.500		2.050			up to 185		89603173
RLE 4x16 4000lm 830 MP ADV2 OTD	3.000	SDCM 3	4.040	80	22,2	up to 182	223 x 45	89603174
RLE 4x16 4000lm 840 MP ADV2 OTD	4.000		4.160			up to 187		89603175
RLE 4x16 4000lm 850 MP ADV2 OTD	5.000		4.220			up to 190		89603176
RLE 4x16 4000lm 865 MP ADV2 OTD	6.500		4.100			up to 185		89603177

<sup>1)</sup> Tolerance range for electrical and optical data: ±10 %; Operation mode of 500 mA

# Module RLE excite (EXC) / advanced (ADV)

Matching driver

Driver			RLE 2x4 2000lm HP EXC2 OTD	RLE 2x8 4000lm HP EXC2 OTD	RLE 2x6 3000lm HP EXC2 OTD	RLE 4x8 2000lm MP ADV2 OTD	RLE 4x16 4000lm MP ADV2 OTD
Designation	Output current (mA)	Order no.					
Driver excite3 (EXC3)/advanced 3 (ADV3)							
LCO 14/100-500/38 o4a NF C EXC3 LCO 14/100-500/38 NF C ADV3	200	87500707 87500821	1	0	1	1	0
	350		1	0	1	1	0
	500		1	0	0	1	0
LCO 24/200-1050/39 o4a NF C EXC3 LCO 24/200-1050/39 NF C ADV3	200 HV	87500708 87500822	1	0	1	1	0
	350 HV		1	0	1	1	0
	500 HV		1	0	1	1	0
	550 HV		1	0	1	1	0
	650 HV		1	0	1	1	0
	700 HV		1	0	0	1	0
LCO 40/200-1050/64 o4a NF C EXC3 LCO 40/200-1050/64 NF C ADV3	200 HV	87500709 87500823	2	1	0	2	1
	350 LV		1	0	1	1	0
	350 HV		2	1	1	2	1
	500 LV		1	0	1	1	0
	500 HV		2	1	1	2	1
	550 LV		1	0	1	1	0
	550 HV		2	1	1	2	1
	650 LV		1	0	1	1	0
	650 HV		2	1	1	2	1
	700 LV		1	0	1	1	0
	700 HV		2	1	1	2	1
	1,050 LV		1	0	1	1	0
LCO 60/200-1050/100 o4a NF C EXC3 LCO 60/200-1050/100 NF C ADV3	200 HV	87500710 87500824	3-4	2	2	3-4	2
	200 LV		2	1	1	2	1
	350 HV		3-4	2	2	3-4	2
	500 LV		2	1	1	2	1
	500 HV		3-4	2	2	3-4	2
	550 LV		2	1	1	2	1
	550 HV		3-4	2	2	0	2
	650 LV		2	1	1	2	1
	650 HV		3	0	2	3	0
	700 LV		2	1	1	2	1
	700 HV		3	0	2	3	0
	1,050 LV		2	1	1	2	1
Driver essence2 (SNC2)							
LCO 75/500/150 fixC L SNC2	500	28002297	3-6	2-3	2-4	3-6	2-3
LCO 75/700/108 fixC L SNC2	700	28002298	2-4	1-2	1-2	2-4	1-2
LCO 75/1050/72 fixC L SNC2	1,050	28002299	1-2	1	1	0	0
LCO 100/500/200 fixC L SNC2	500	28002301	3-8	2-4	2-5	3-8	2-4
LCO 100/700/143 fixC L SNC2	700	28002302	2-5	1-2	2-3	2-5	1-2
LCO 100/1050/95 fixC L SNC2	1,050	28002303	2-3	1	1-2	0	0
LCO 150/500/300 fixC L SNC2	500	28002305	5-12	3-6	3-8	5-12	3-6
LCO 150/700/214 fixC L SNC2	700	28002306	3-8	2-4	2-5	3-8	2-4
LCO 150/1050/142 fixC L SNC2	1,050	28002307	2-5	1-2	2-3	0	0
LCO 200/500/400 fixC L SNC2	500	28002309	7-16	4-8	5-10	7-16	4-8
LCO 200/700/285 fixC L SNC2	700	28002310	5-11	3-5	3-7	5-11	3-5
LCO 200/1050/190 fixC L SNC2	1,050	28002311	3-7	2-3	2-5	0	0

Specification: Number of possible modules per LED driver

# Modules RLE excite (EXC) / advanced (ADV) series

The corresponding drivers (number of possible LED modules connected in series per LED driver)

Driver			RLE 2x4 2000lm HP EXC2 OTD	RLE 2x8 4000lm HP EXC2 OTD	RLE 2x6 3000lm HP EXC2 OTD	RLE 4x8 2000lm MP ADV2 OTD	RLE 4x16 4000lm MP ADV2 OTD	
Type	Output current (mA)	Order no.						
LCO 135/200-1050/220 o4a NF C EXC3 LCO 135/200-1050/220 NF C ADV3	200	HV	87500716 87500826	7-9	4	5-6	7-9	4
	350	LV		4-5	2	3	4-5	2
		HV		5-9	3-4	4-6	5-9	3-4
	500	LV		3-5	2	2-3	3-5	2
		HV		5-9	3-4	4-6	5-8	3-4
	550	LV		3-5	2	2-3	3-5	2
		HV		5-9	3-4	4-6	5-8	3-4
	650	LV		3-5	2	2-3	3-5	2
		HV		5-8	3-4	4-5	5-8	3-4
	700	LV		3-5	2	2-3	3-5	2
		HV		5-7	3	4-5	5-7	3
	1.050	LV		3-5	2	2-3	3-4	2
		HV		5	0	0	0	0
	LCO 200/200-1050/355 o4a NF C EXC3 LCO 200/200-1050/355 NF C ADV3	200		LV	87500711 87500827	8	4	0
HV			9-15	5-7		6-10	9-15	5-7
350		LV	5-8	3-4		4-5	5-8	3-4
		HV	9-14	5-7		6-9	8-14	4-7
500		LV	5-8	3-4		4-5	5-8	3-4
		HV	8-14	4-7		6-9	8-14	4-7
550		LV	5-8	3-4		4-5	5-8	3-4
		HV	8-14	4-7		6-9	8-14	4-7
650		LV	5-8	3-4		4-5	5-8	3-4
		HV	8-12	4-6		6-8	8-12	4-6
700		LV	5-8	3-4		4-5	5-8	3-4
		HV	8-11	4-5		6-7	8-11	4-5
1.050		LV	5-7	3		4-5	5-7	3
Driver essence (SNC) 2								
LCO 75/500/150 fixC L SNC2	500	28002297	3-6	2-3	2-4	3-6	2-3	
LCO 75/700/108 fixC L SNC2	700	28002298	2-4	1-2	1-2	2-4	1-2	
LCO 75/1050/72 fixC L SNC2	1.050	28002299	1-2	1	1	0	0	
LCO 100/500/200 fixC L SNC2	500	28002301	3-8	2-4	2-5	3-8	2-4	
LCO 100/700/143 fixC L SNC2	700	28002302	2-5	1-2	2-3	2-5	1-2	
LCO 100/1050/95 fixC L SNC2	1.050	28002303	2-3	1	1-2	0	0	
LCO 150/500/300 fixC L SNC2	500	28002305	5-12	3-6	3-8	5-12	3-6	
LCO 150/700/214 fixC L SNC2	700	28002306	3-8	2-4	2-5	3-8	2-4	
LCO 150/1050/142 fixC L SNC2	1.050	28002307	2-5	1-2	2-3	0	0	
LCO 200/500/400 fixC L SNC2	500	28002309	7-16	4-8	5-10	7-16	4-8	
LCO 200/700/285 fixC L SNC2	700	28002310	5-11	3-5	3-7	5-11	3-5	
LCO 200/1050/190 fixC L SNC2	1.050	28002311	3-7	2-3	2-5	0	0	

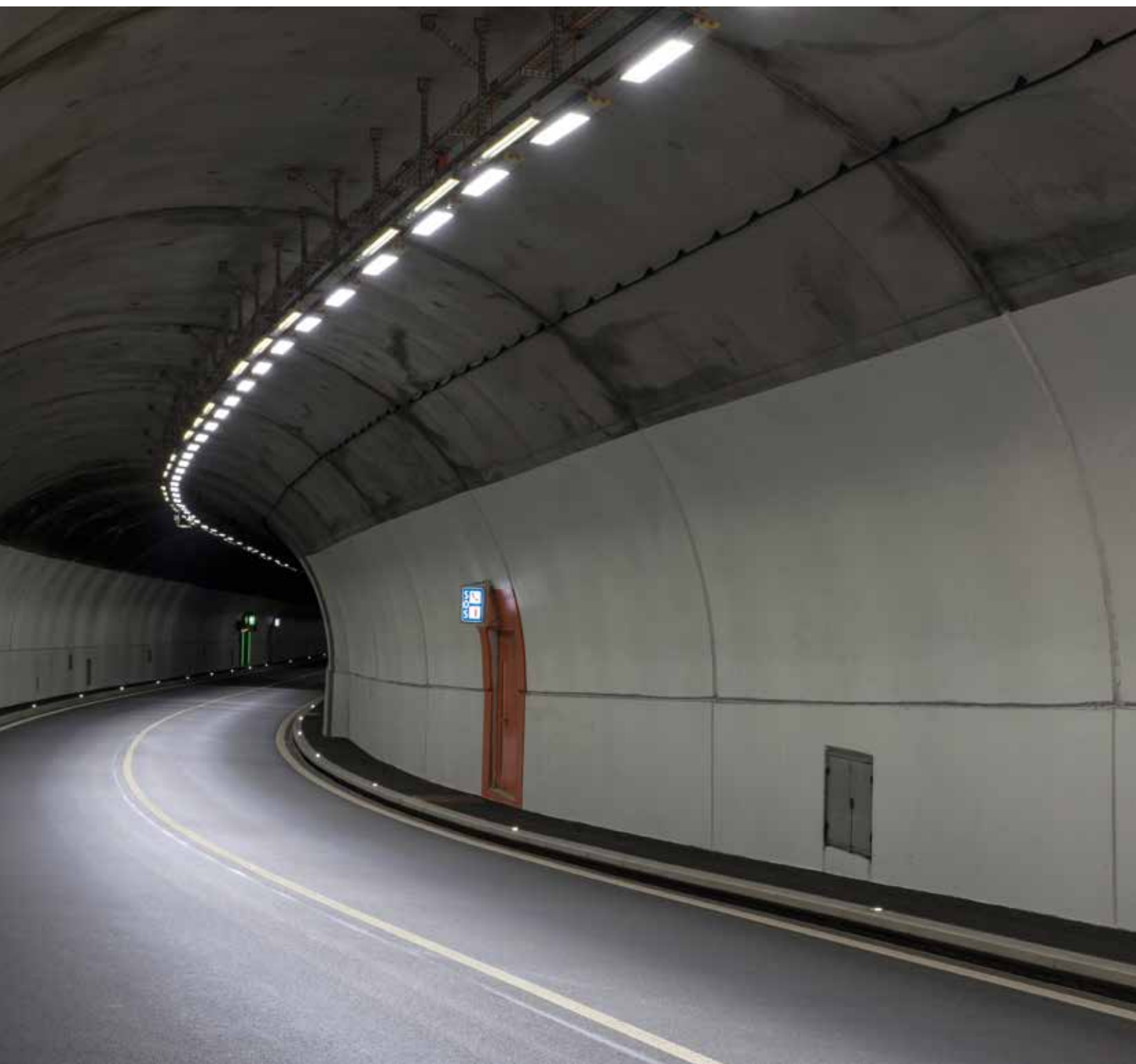
Specification: Number of possible modules per LED driver; parallel or mixed circuits can be found in the Setbuilder

Trusted outdoor solutions

## Reference projects

### Schallbergtunnel, Switzerland

Following the general refurbishment, the 500 m long Schallbergtunnel is shining in a new light. The luminaires were developed by Rigamonti, the Swiss specialist in tunnel lighting, and executed with LED components by Tridonic. The result is an efficient lighting system with high visual comfort, which has a positive impact on the perception of safety. New LED modules, based on the highly efficient RLE series, are used in the adaptation luminaires of the entrance and exit areas.





## Reference project

### Street lighting with partner SECE, Spain



The Spanish towns of Lloret de Mar, Tarragona and Granollers commissioned outdoor lighting that could adapt to the widely varying visitor frequency, be controlled centrally and consume as little energy as possible. The possibility of central control and the existing lighting infrastructure were to be maintained. Dimmable outdoor premium drivers with universal one4all interface were used as the control gear for the new LED luminaires. The illuminance can be adjusted via the GridControl function. With the U6Me2 protocol, signals can be transmitted directly via the mains line, which enables a particularly convenient luminaire configuration at the control cabinet.

#### Requirements:

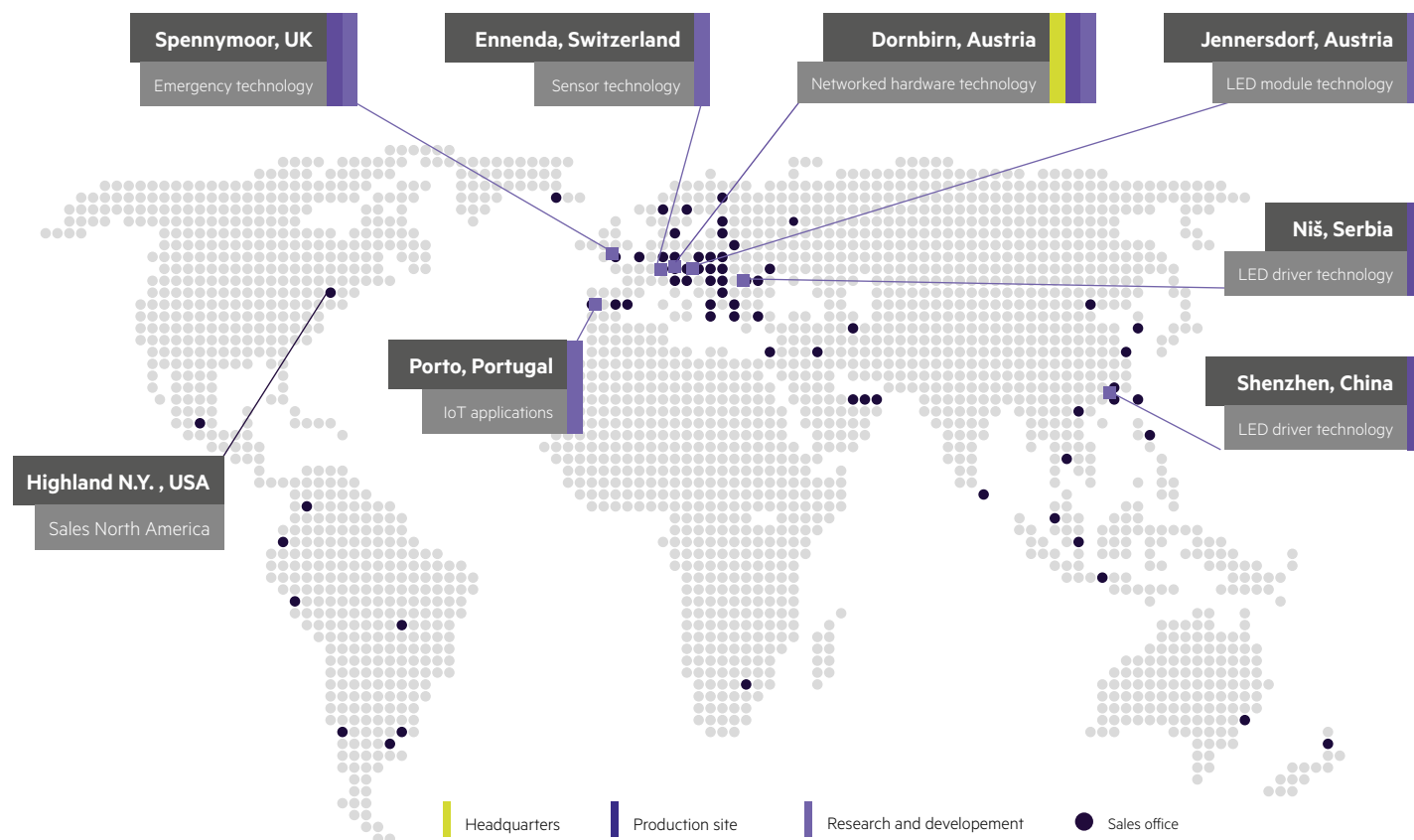
- More efficient lighting while maintaining the existing lighting infrastructure
- Improved comfort and flexibility of the existing control options
- Adaptable illuminance with regard to seasons and number of visitors

#### Solution:

- Premium dimmable drivers equipped with a universal one4all interface as control devices for the new LED lamps
- Centralised Telecontrol-system via GridControl (U6Me2) Technology: SECE, a Spanish Utility company developed a remote control system that brings smart and connected lighting functionality based on U6Me2
- chronoSTEP function to adapt dimming level automatically or manually to dusk and dawn

# Prepared for the future

## Our activities and locations



1,932

Around 1,900 employees throughout the world are committed to helping you with their know-how and creativity to create the perfect light.

6

There are six research and development centres in which new LEDs and networked lighting technologies are being developed.

3

There are three things you can rely on at Tridonic: optimum product quality, decades of expertise and our committed and flexible support.

1

In our unique software competence center in Porto (Portugal), information technology experts are developing new solutions for smart buildings and smart cities. They are working on a range of products from intelligent lighting management and control systems to highly advanced IoT solutions and their matching digital services.

21

With 21 branch offices on five continents we are there for you wherever you are in the world.

2,600

That's how many patents and inventions testify to Tridonic's extraordinary powers of innovation.

### Details

For further information, data sheets, product catalogues and ordering details, please go to [www.tridonic.com](http://www.tridonic.com).

# Present worldwide

## AUSTRALIA

Tridonic Australia Pty Ltd  
2/7 Millner Ave  
Horsley Park, NSW 2175  
Australia  
T +61 2 9832 6600  
F +61 2 9832 6688  
www.tridonic.com  
infoau@tridonic.com

## AUSTRIA

Tridonic GmbH & Co KG  
(Headquarters)  
Färbergasse 15  
6851 Dornbirn, Austria  
T +43 5572 395-0  
F +43 5572 20176  
www.tridonic.com  
sales@tridonic.com

Tridonic GmbH & Co KG  
Sales Austria  
Archenweg 58  
6022 Innsbruck, Austria  
T +43 512 3321 554  
F +43 512 3321 995554  
www.tridonic.com  
vertrieb.austria@tridonic.com

## CHINA

Tridonic (Shanghai) Co., Ltd.  
(Headquarters)  
Room 602, Building B  
Zhongshan International Plaza  
No. 789 Tianshan Road  
Shanghai, 200335, China  
T +86 21 52400 599  
F +86 21 52400 230  
www.tridonic.com  
china@tridonic.com

Tridonic (Shanghai) Co., Ltd.  
Beijing Branch  
Room 1207, No. 3, Yard 1  
Tian Xin Street,  
Fang Shan District  
Beijing, 102446, China  
T +86 10 6522 6163  
F +86 10 6522 7003  
www.tridonic.com  
china@tridonic.com

Tridonic (Shanghai) Co., Ltd.  
Guangzhou Branch  
Room 505, R & F Profit Plaza  
76 Huangpu Xi Road, Tianhe District  
Guangzhou, 510623, China  
T +86 20 3839 2483  
F +86 20 3839 2482  
www.tridonic.com  
china@tridonic.com

## FRANCE

Tridonic France SARL  
8 Rue de Bruxelles  
ZI Krafft  
67150 Erstein, France  
T +33 3 88 59 62 70  
F +33 3 88 59 62 75  
www.tridonic.fr  
info.france@tridonic.com

## GERMANY

Tridonic Deutschland GmbH  
Edisonallee 1  
89231 Neu-Ulm  
Germany  
T +49 731 176629-0  
F +49 731 176629-15  
www.tridonic.de  
vertrieb.deutschland@tridonic.com

## ITALY

Tridonic Italia srl  
Via G. Savelli, 86  
35129 Padova  
Italy  
T +39 049 89 45 127  
www.tridonic.it  
vendite.italia@tridonic.com

## KOREA

Tridonic Korea LLC  
Mark Kim  
#808 HanHwa BizMetro II  
551-24 Yangcheon-ro  
Gangseo-gu Seoul  
Republic of Korea (South)  
T +82 10 9922 3878  
www.tridonic.kr  
mark.kim@tridonic.com

## MALAYSIA

Tridonic Malaysia Sdn Bhd  
V03-10-01 Designer Office,  
Lingkaran SV,  
Sunway Velocity, Cheras  
55100 Kuala Lumpur  
Malaysia  
T +60 3 2733 6484  
T +60 3 2733 6485  
www.tridonic.com  
asean@tridonic.com

## MIDDLE EAST

Tridonic Middle East (FZE)  
Warehouse LB 4 Blue Shed Area,  
JAFZA North, Jebel Ali  
P.O. Box 17972  
Dubai, United Arab Emirates  
T +971 4 8833 664  
F +971 4 8833 665  
www.tridonic.ae  
sales.middleeast@tridonic.com

## NEW ZEALAND

Tridonic New Zealand  
PO Box 71134, Rosebank  
Auckland 1348  
27 Jomac Place, Avondale  
Auckland 1026  
T +64 9820 1119  
F +64 9820 4471  
www.tridonic.com  
sales@tridonic.co.nz

## POLAND

Tridonic Rep. Office Poland  
Poland  
www.tridonic.com  
marek.michalski@tridonic.com

## PORTUGAL

Tridonic Portugal, Unipessoal Lda.  
Rotunda Engenheiro  
Edgar Cardoso, 23, piso 8  
Vila Nova de Gaia 4400-676  
Portugal  
T +351 938 448 467  
www.tridonic.com  
ventas@tridonic.com

## SINGAPORE

Tridonic S. E. A. Pte Ltd  
158 Kallang Way  
#06-02  
349245 Singapore  
Singapore  
T +65 6749 9071  
F +65 6293 3700  
www.tridonic.com  
asean@tridonic.com

## SOUTH AFRICA

Tridonic SA (Pty) Ltd  
Unit A7, Centurion Business Park  
Cnr. Bosmansdam Road &  
Democracy Way  
Milnerton, SA, 7441  
South Africa  
T +27 21 110 5687  
www.tridonic.com  
info@tridonic.com

## SPAIN

Tridonic Iberia, S.L.  
Calle Carpinteros nº 8, 2a  
28670 Villaviciosa de Odón  
Spain  
T +34 916 162 095  
www.tridonic.es  
ventas@tridonic.com

## SWITZERLAND

Tridonic AG  
Obere Allmeind 2  
8755 Ennenda  
Switzerland  
T +41 55 645 4747  
www.tridonic.ch  
vertrieb.schweiz@tridonic.com

## TURKEY

Tridonic Aydınlatma Tic.LTD.ŞTİ.  
Kemankeş Mah., Necatibey cad.  
Akçe Sok., Akçe Han 10  
34420 Karaköy / Beyoğlu  
Istanbul, Turkey  
T +90 212 244 78 05  
F +90 212 244 78 06  
www.tridonic.com  
satis@tridonic.com

## UNITED KINGDOM

Tridonic UK Limited  
Unit 5 Cherrywood  
Chineham Business Park  
Stag Oak Lane, Chineham  
RG24 8WF Basingstoke  
Hampshire  
United Kingdom  
T +44 1256 374300  
www.tridonic.com  
enquiries.uk@tridonic.com

## USA

Tridonic Inc. USA  
3300 Route 9W  
Highland, NY 12528  
United States  
www.tridonic.us  
sales.us@tridonic.com

## Headquarters

Tridonic GmbH & Co KG  
Färbergasse 15 | 6851 Dornbirn, Austria  
T +43 5572 395-0 | F +43 5572 20176  
www.tridonic.com | sales@tridonic.com

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