# Uniform standards for more transparency.

**Up to now, the standardisation of electronic control gear for LED modules was not clearly defined. Big lighting companies followed the safety standard for electronic lamp converters. Other manufacturers offered 24 V standard power supplies taken from information technology. Thus, a safe use of LED lighting could not be guaranteed. The passage of the new safety standard IEC/EN 61347-2-13 and performance standard IEC/EN 62384 provides clarity at last. The new standards for electronic control gear for LED modules enhance the transparency of the market and define the requirements which have to be fulfilled in a comprehensible way.**

**The new standards. Nothing new for our electronic control gear.**
Since the middle of 2006, two new standards have been in effect that clearly define the safety and performance requirements for LED converters for lighting installations.

Due to its own high demands on quality, OSRAM early and decisively promoted the development of new standards in the field of lighting technology. Accordingly, the entire range of OPTOTRONIC® electronic control gear meets future requirements already today.

**ENEC.**
Because our OPTOTRONIC® electronic control gear complies with the safety and performance standards, it bears the ENEC approval mark. With the acquisition of the ENEC license for electronic control gear for LED modules, OSRAM makes it easier for luminaire manufacturers to get their luminaires approved, thus relieving them of a cost-intensive quality control.

**ENEC = Safety + Performance**

**Consequence.**
If electronic control gear for LED modules is not licensed according to the mentioned standards and is applied in luminaire manufacturing, the quality of the gear has to be confirmed by a certification agency. To achieve the same results as with licensed gear, an extensive risk analysis is required before the actual quality control.

# Safety and performance. The new standards at a glance.

**New safety standard IEC/EN 61347-2-13.**
Compliance with this safety standard is required for all LED converters for lighting installations. This concerns LED converters that operate LED modules, LED systems and single LEDs.

This standard provides safety for the user and basically includes protection against electrical shock and protection against the thermic behaviour of the electronic control gear in case of malfunction.

The protection against electrical shock relies on the operation with safety extra low voltage (SELV or SELV equivalent) or appropriate insulation for higher voltages. The safety extra low voltage ensures that the LED modules can be touched without any risk. Furthermore, in case of malfunction, no smoke emission or easy flammability must occur. Therefore, all LED converters must be equipped with temperature cut-offs. OPTOTRONIC® electronic control gear guarantees safe use as a built-in type for luminaires or as an independent device.

**New performance standard IEC/EN 62384.**
This standard defines the optimal coordination between the electronic control gear and the LEDs. The performance standard ensures compliance with the operating parameters of the LEDs and thus optimises the service life of the system.

*LED converters from OSRAM already meet the new standards and thus provide more safety.*

# Our all-rounders meet the EMC standards blindfold.

**The EMC standards define the limits of acceptable interference of electronic gear as well as the permitted circuit feedback. The technical and legal conditions for electromagnetic compatibility (EMC) are determined by guidelines, regulations and standards. Only under those conditions must electronic gear be operated. OPTOTRONIC® electronic control gear bears the CE approval mark, i. e. it complies with the EMC standards and the safety standard.**

**CE = EMC + safety**

The EMC is defined by the following basic standards:

**EN 55015 – radiated and conducted radio interference suppression.**
The limit values of radio interference must not be exceeded.

**IEC/EN 61547 – EMC immunity to interference.**
When standardised interferences are applied, electronic control gear is only allowed to alter its characteristics within the limits specified by the standard.

**IEC/EN 61000-3-2 – Harmonic content.**
Electronic control gear must not disturb the mains supply with an “irregular current drain”, i. e. with harmonics.

*OPTOTRONIC® electronic control gear from OSRAM shows its advantages especially in challenging surroundings, as seen here in a theatre in Zagreb.*

# Standards are good. OPTOTRONIC® electronic control gear is better.

*Electronic control gear for LED modules from OSRAM can be safely installed and easily integrated into the respective application.*

**Long-lasting, safe, energy-saving.**
OPTOTRONIC® electronic control gear establishes ideal conditions for a long, safe and economical operation. The advantages at a glance:

- High reliability due to long life
- Protection mechanisms against short-circuit, overload and overheating
- Galvanic insulation between primary and secondary sides (SELV or SELV equivalent)
- Radio interference suppression up to 300 MHz (according to EN 55015, Amendment 1, Issue October/2006, expected transition period for older gear until the end of 2010)
- Easier integration into furniture and wooden ceilings due to compliance with the German standard DIN 57710
- Minimised energy consumption due to high efficiency
- Wide range of permitted ambient temperature
- Long secondary cables, permitted length up to 10 m
- Several LED modules can be connected in parallel or in series within the specified output range
- Small space requirements due to the compact and functional design

# OPTOTRONIC® electronic control gear. For any occasion.

**With the LED systems from OSRAM, intelligent lighting solutions can be achieved in highly varied fields of application. The exact coordination of the LED module and the electronic control gear is crucial for the functionality and the efficiency of a system. In combination with LED modules, OPTOTRONIC® electronic control gear provides flexible options for individual lighting design.**

## OPTOTRONIC® for 10 V and 24 V LED modules

- Output voltage of 10 V and 24 V; electronically controlled, constant DC voltage
- Wide range of products with an output wattage of 6 to 300 W [1)]
- Parallel connection of several LED modules within specified output range
- Intelligent power matching for LED modules (**S**mart **P**ower **S**upply) with OPTOTRONIC® OT 50 and OT 75
- Devices for outdoor application (IP 64 and IP 65)

1) With four OT 75 E which are connected in parallel on the secondary side or 250 W with five OT 50 E which are separately connected in parallel.

## OPTOTRONIC® controllers for 10 V and 24 V LED modules

- In combination with any 10 V and 24 V OPTOTRONIC® electronic control gear
- 1-Channel dimmer with DALI®; ***Touch DIM***® function and 1…10 V interface for lighting control
- 3-Channel dimmer for RGB colour effects with DMX or 1…10 V interface
- RGB sequencer for dynamic colour control
- Parallel connection of several LED modules with two terminals

## OPTOTRONIC® all-in-one products 24 V

**OT EASY 60**

- 60 W electronic control gear and configurable LED controller for static and dynamic lighting applications
- Integrated RGB+W sequencer and scene storage; sequenced or static recall of lighting scenes
- Configuration with software (EASY Color Control), IR remote control, push-button coupler
- Integration into the EASY Color Control Light Management System
- Cable clamp for independent installation
- Interconnection of up to 16 OT EASY 60

**OT DALI® 25**

- DALI® addressable converter for RGB color mixing
- 25 W electronic control gear for static and dynamic lighting applications
- Cable clamp for independent installation

## OPTOTRONIC® for 350 and 700 (500) mA LED modules

- Specifically developed for the operation of high-flux LED modules
- Electronically controlled constant current
- Dimmable version also available
- Connection in series of several high-flux LED modules within specified output range

## OPTOTRONIC® General characteristics

- Compact, functional design with or without cable clamp
- Safe operation due to galvanic insulation between primary and secondary sides (SELV or SELV equivalent)
- Electronically reversible cut-off in case of short-circuit, overload or overheating
- Secondary cables with maximum length of 10 m
- Low power loss

## TECHNICAL DATA

| Product reference | Product number (EAN) | Wattage (W) | Protection type | Cable clamp | DIM interface |
|---|---|---|---|---|---|
| **OPTOTRONIC® for static lighting solutions** | | | | | |
| OPTOTRONIC OT 6/200-240/10 CE | 4008321**113306** | 6 | IP 65 | | |
| OPTOTRONIC OT 6/100-120/10 CE | 4008321**128911** | 6 | IP 65 | | |
| OPTOTRONIC OT 12/220-240/10 LE | 4008321**174253** | 12 | IP 65 | | |
| OPTOTRONIC OT 12/230-240/10 | 4050300**609232** | 12 | IP 20 | • | |
| OPTOTRONIC OT 50/220-240/10 | 4050300**817491** | 50 | IP 20 | • | |
| OPTOTRONIC OT 50/120-277/10 E | 4050300**861517** | 50 | IP 64 | | |
| OPTOTRONIC OT 6/200-240/24 CE | 4008321**113269** | 6 | IP 65 | | |
| OPTOTRONIC OT 6/100-120/24 CE | 4008321**129130** | 6 | IP 65 | | |
| OPTOTRONIC OT 8/200-240/24 | 4008321**040176** | 8 | IP 20 | | |
| OPTOTRONIC OT 20/230-240/24 | 4050300**618111** | 20 | IP 20 | • | |
| OPTOTRONIC OT 20/120-240/24 S | 4050300**662626** | 20 | IP 20 | | |
| OPTOTRONIC OT 75/220-240/24 | 4050300**817477** | 75 | IP 20 | • | |
| OPTOTRONIC OT 75/120-277/24 E | 4050300**861494** | 75 | IP 64 | | |
| OPTOTRONIC OT 9/200-240/350 | 4050300**888279** | 9 | IP 20 | | |
| OPTOTRONIC OT 9/200-240/350 DIM | 4008321**187321** | 9 | IP 20 | • | • |
| OPTOTRONIC OT 9/100-120/350 E | 4050300**888842** | 9 | IP 20 | | |
| OPTOTRONIC OT 18/200-240/700 DIM | 4008321**139320** | 18 | IP 20 | • | • |
| OPTOTRONIC OT 35/200-240/700 | 4008321**169365** | 35 | IP 20 | | |

| Product reference | Product number (EAN) | Wattage (W) | Number of outputs | $U_{IN}$ (V) | Control signal | $U_{OUT}$ $I_{OUT}$ |
|---|---|---|---|---|---|---|
| **OPTOTRONIC® for dimmable lighting and basic RGB lighting solutions** | | | | | | |
| OPTOTRONIC OT DIM | 4050300**943459** | - | 1 | 10–24 (DC) | 1…10V | 10V/24V |
| OPTOTRONIC OT RGB | 4050300**793108** | - | 3 | 10–24 (DC) | 1…10V | 10V/24V |
| OPTOTRONIC OT 9/10-24/350 DIM | 4050300**888903** | 9 | 1 | 10–24 (DC) | 1…10V | 350 mA |
| OPTOTRONIC OT 9/200-240/350 DIM | 4008321**187321** | 9 | 1 | 200–240 (AC) | 1…10V | 350 mA |
| OPTOTRONIC OT 18/200-240/700 DIM | 4008321**139320** | 18 | 1 | 200–240 (AC) | 1…10V | 700 mA |
| OPTOTRONIC OT RGB SEQ | 4050300**792460** | - | 3 | 10–24 (DC) | 1…10V | 10V/24V |
| OPTOTRONIC OTi DALI DIM | 4008321**061195** | - | 1 | 10–24 (DC) | DALI or Touch DIM | 10V/24V |
| OPTOTRONIC OT DMX RGB | 4008321**160829** | - | 3 | 10–24 (DC) | DMX | 10V/24V |
| **OPTOTRONIC® for individually configurable RGB+W lighting solutions** | | | | | | |
| OPTOTRONIC OT DALI 25/220-240/24 RGB | 4050300**829463** | 25 | 3 | 220–240 (AC) | DALI | 24V |
| OPTOTRONIC OT EASY 60/220-240/24 RGB + W | 4008321**187796** | 60 | 4 | 220–240 (AC) | EASY | 24V |

Further information on OPTOTRONIC® and LED modules from OSRAM can be found in the OT technical handbook or in our brochures about illuminated advertising.
(Download -> www.osram.com)

Please make use of our convenient online tools:
The LED module Quickfinder helps you to find the right lighting source. The online calculation program LED deSIGNER determines the ideal amount of applied LED modules and specifies, among other things, the appropriate electronic control gear.