LED Driver

LCA PRE OTD

Product Manual

TRIDONIC

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Scope of documentation

These operating instructions are valid for LED Drivers of the LCA PRE OTD series.

TRIDONIC GmbH & Co KG is constantly striving to develop all its products. This means that there may be changes in form, equipment and technology.
Claims cannot therefore be made on the basis of information, diagrams or descriptions in these instructions.
The latest version of these operating instructions is available on our home page at
http://www.tridonic.com/com/en/operating-instructions.asp

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We are always open to comments, corrections and requests. Please send them to info@tridonic.com

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General safety instructions

The instructions in this section have been compiled to ensure that operators and users of LED Drivers of the LCA PRE OTD series from Tridonic are able to detect potential risks on time and take the necessary preventative measures.
The operator must ensure that all users fully understand these instructions and follow them. This device may only be installed and configured by suitably qualified personnel.

Intended use

Proper use

Operation of LED light modules. The device may only be used for this intended purpose.

Improper use

Outdoor use. Extensions and modifications to the product.

WARNING!

Improper use could result in injury, malfunction or damage to property.
It must be ensured that the operator informs every user of existing hazards.

Dangers associated with the operation of the system

DANGER!

Danger of electrocution
Disconnect the power of the entire lighting system before working on the lighting system!

Environment

DANGER!

Not to be used in corrosive or explosive environments.

CAUTION!

Risk of damage caused by humidity and condensation

- Use use the control device only in dry rooms and protect it against humidity!
- Prior to commissioning the system, wait until the control device is at room temperature and completely dry!

General safety instructions

Additional instructions

⚠ CAUTION!

Electromagnetic compatibility (EMC)
Although the device meets the stringent requirements of the appropriate directives and standards on electromagnetic compatibility, it could potentially interfere with other devices under certain circumstances!

Description and key features

Description of key features

LCA PRE OTD is a specially designed portfolio for outdoor and industrial applications. It has been optimised to meet the hardest requirements in outdoor LED applications.

- Special design:
  The LCA PRE OTD offer a safe and reliable solution under difficult weather and electrical circumstances (e.g. street and roadlight, tunnel, carpark)
- Lifetime:
  Excellent lifetime thanks to special design
- Safety:
  Up to 10 kV surge/burst protection
- Thermomanagement:
  t_a up to 70 °C with 65,000 hours lifetime
- State-of-the-art dimming technology:
  Stepless dimming from 100 to 10 %
- Diversity of functions:
  Dimming, DALI, DSI, switchDIM, corridorFUNCTION, ready2mains, chronoSTEP, U6Me2 (cabinet programming)

Description and key features

Main values and functions

Dimming

Portfolio	Description
Dimmable	✅
Dimming method	Amplitude dimming
Dimming range	100 to 10%
Dimming curve	Logarithmic dimming curve (standard) Switching to linear dimming curve via masterCONFIGURATOR is possible.
Dimming interfaces	DALI V2-DT6, DSI, ready2mains, corridorFUNCTION V2, switchDIM, chronoSTEP

Functions

Portfolio	Description
Intelligent Voltage Guard	✅
Intelligent Temperature Guard	✅
Power-up Fading	✅
DC Operation	DC level adjustable supporting EN 50172
Constant Light Output	✅
Configuration Interfaces	DALI V2-DT6, ready2mains, U6Me2

Output current

Portfolio	Description
Adjustable output current	✅
Adjustable via...	DALI V2-DT6, ready2mains, I-select 2 plug (resistor)
Step size	1 mA
Tolerance	Further information can be found in the data sheet (see Reference list, p. 56).

Description and key features

Technical data

Portfolio	Description
Rated supply voltage	220-240 V
Standby losses	< 0.16 W

Description and key features

Housing variants

LCA OTD is available in three different housing sizes:

Image	Description
	Housing variant in 30W, 60W, 75W drivers _ Compact shape for installation inside the luminaire casing (in-built) _ Typical area of application: Road, street, industry _ Dimensions: 133 x 77 x 40 mm
	Housing variant in 120W driver _ Compact shape for installation inside the luminaire casing (in-built) _ Typical area of application: Road, street, industry _ Dimensions: 150 x 90 x 40 mm
	Housing variant in 160W driver _ Compact shape for installation inside the luminaire casing (in-built) _ Typical area of application: Road, street, industry _ Dimensions: 170 x 100 x 40 mm

Description and key features

Adjustable output current

The output current can be adjusted via DALI V2-DT6, ready2mains, I-select 2 plug (resistor).

Adjusting the output current via DALI or ready2mains

Further information about DALI (see DALI, p. 44) or ready2mains (see ready2mains, p. 46) can be found in the corresponding function description.

Adjusting the output current via I-select 2 plugs

By inserting a suitable resistor into the I-select 2 interface, the current value can be adjusted.

The most important data of the I-select 2 plug looks as follows:

- Ready-for-use resistor to set output current value
- Compatible with LED Driver featuring I-select 2 interface; not compatible with I-select (generation 1)
- Resistor is base isolated
- Resistor power 0.25 W
- Current tolerance ± 2 % to nominal current value
- Compatible with LED Driver series PRE OTD

If the resistor is connected by wires a consistent base isolation must be ensured. Furthermore, a max. wire length of 2 m must not be exceeded. Potential interference has to be avoided because it can cause additional tolerance to the output current. To ensure no influence of interference on the resistor value use shielded wires to connect the I-select 2 plug. GND of shielded wire must be connected to the corresponding I-select 2 plug terminal marked with GND in the datasheet.

LED modules with on-board I-select 2 resistors may cause irreparable damages, caused by surge / burst peaks.

NOTICE

Please note that the resistor values for I-select 2 are not compatible with I-select (generation 1). Installation of an incorrect resistor may cause irreparable damage to the LED module(s).

Resistors for the main output current values can be ordered from Tridonic. Further information about accessories can be found on the TRIDONIC homepage (see Reference list, p. 56).

NOTICE

The MAX plug, which can be used for LED Drivers of the PRE series, serves as a deactivation plug (CHRO OFF) for LED Drivers of the OTD series and deactivates the chronoSTEP function.

Adjusting the output current via different resistance values

The output current of the LED Driver can be changed by setting different resistances.The resistance values are taken from the E96 series.

The relationship between output current and resistor value looks like this:

Description and key features

_ R [kOhm] = 5 V / I_out [mA] x 1,000

_ Resistor value tolerance <= 1 %; resistor power >= 0.1 W; base isolation necessary

NOTICE

The final nominal output current depends on:

_ Tolerance of resistance

_ Tolerance of the device interface (up to 2 %)

_ Output current tolerance of the device

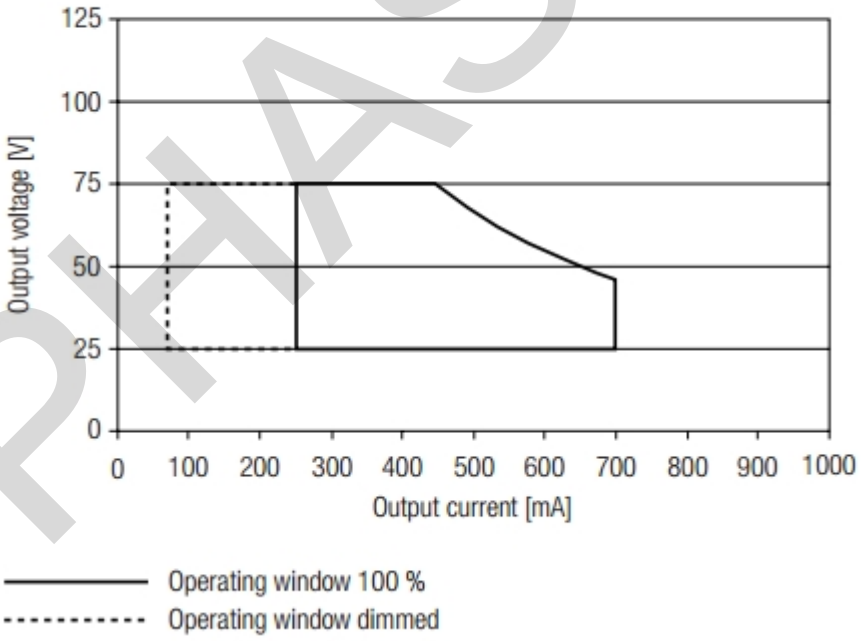
Further information about resistance and output current tolerance can be found in the data sheet (see Reference list, p. 56).

Unlike DALI and ready2mains which do not generate additional tolerances in the output current, tolerances are higher when using I -select 2 plugs.

Output voltage

The output voltage range results from the selected current. More information can be found in the data sheet (see Reference list, p. 56).
The output current can be adjusted via DALI, ready2mains or an I-Select 2 resistor. The diagrams below show the forward voltage ranges as a function of the output current and are intended as a guide. For detailed values and an explanation of the methods available please refer to the data sheets (see Reference list, p. 56).

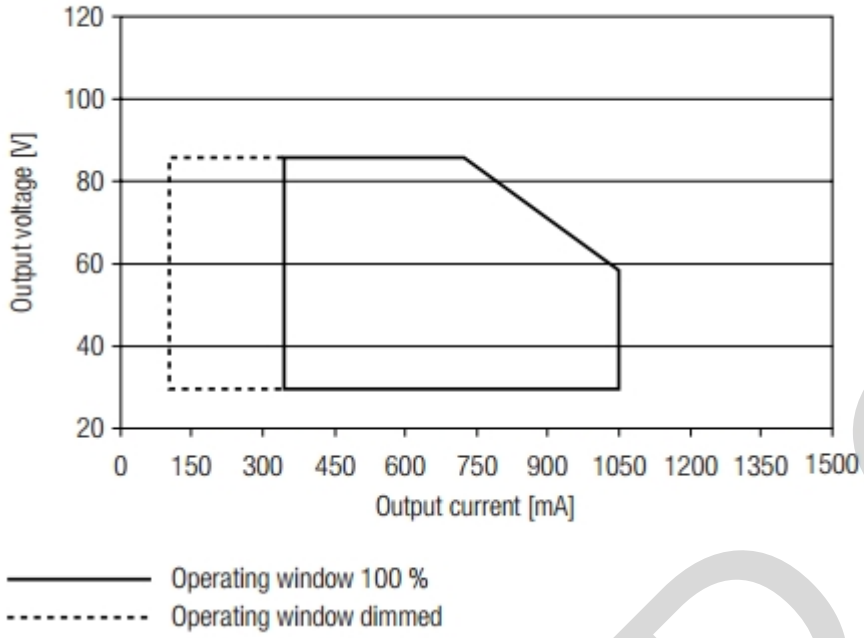
4.1 Operating window



LCA PRE OTD 30W

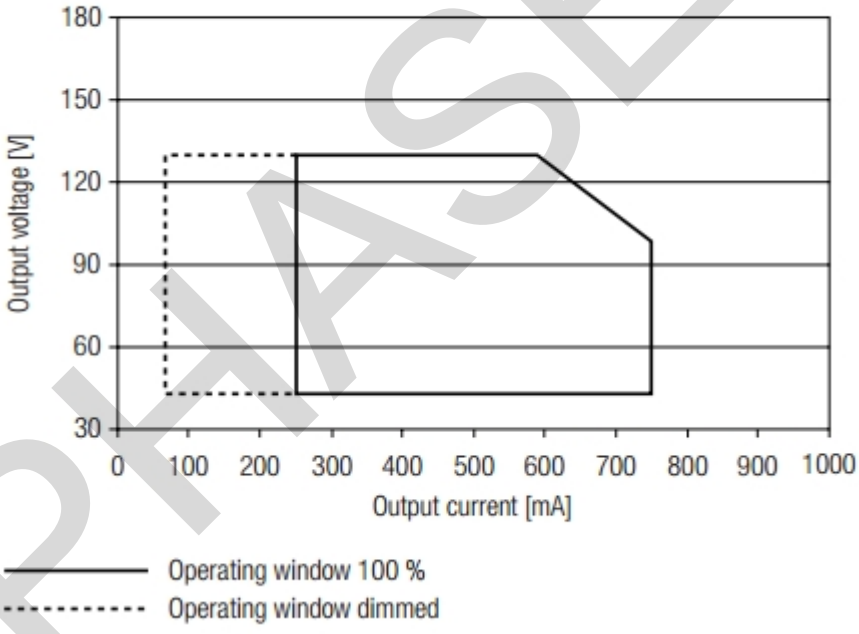
Description and key features

4.1 Operating window



LCA PRE OTD 60W

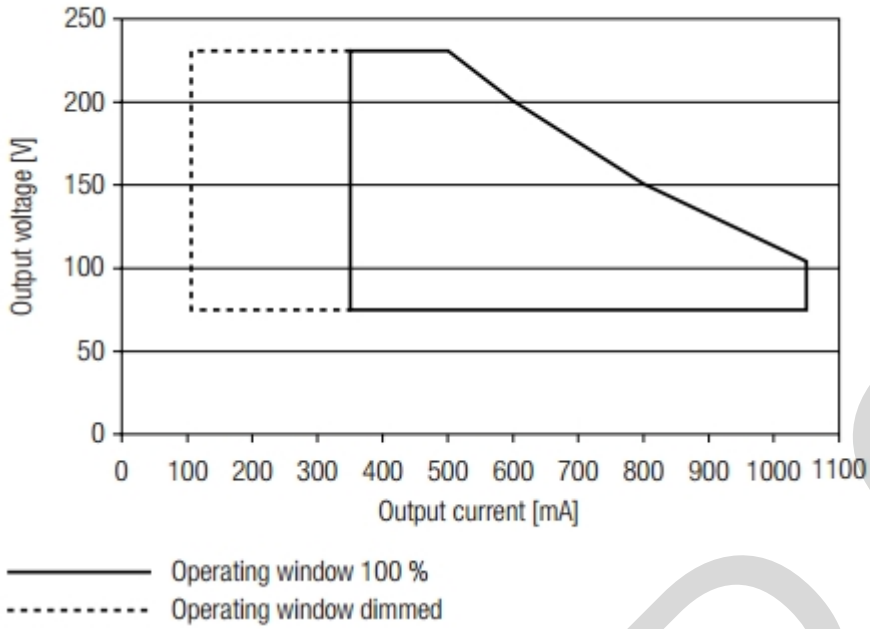
4.1 Operating window



LCA PRE OTD 75W

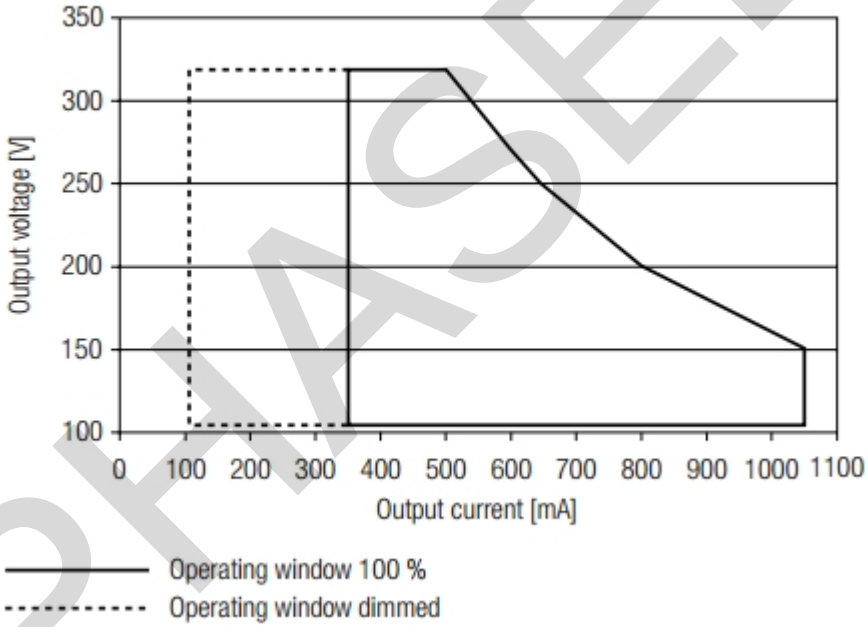
Description and key features

4.1 Operating window



LCA PRE OTD 120W

4.1 Operating window



LCA PRE OTD 160W

Compatibility between LED module and LED Driver

There are two stages involved in the check for compatibility between the LED module and the LED Driver.

- The requirements for operating together can be checked by comparing the data sheets
- Subsequent practical tests can ensure that there are no unexpected problems during actual operation

Comparison of data sheet values with a 5-point guideline

Different values for the two devices need to be considered when comparing the data sheets. The following table shows which values are involved and which requirements they must meet.

Comparison of...	Value in LED module		Value in LED Driver	Detailed procedure
(1) Current	I_{rated} @HO	>=	Output current	- Determine forward current of module - Check whether LED Driver can be operated with the same output current - Check whether I_{max} of module is greater than or equal to output current of LED Driver (including tolerances) ⚠ CAUTION! The I_{max} can be temperature dependent! Refer to the derating curve of the LED module data sheet.
	I_{max}	>=	Output current + tolerances	

turn page... ->

Compatibility between LED module and LED Driver

Comparison of...	Value in LED module		Value in LED Driver	Detailed procedure
(2) Voltage	Min. forward voltage	>	Min. output voltage	_ Check whether voltage range of LED module is completely within the voltage range of LED Driver
	Max. forward voltage	<	Max. output voltage	**CAUTION!** **The forward voltage is temperature dependent!** **Refer to the Vf/t_p diagram in the data sheet.**
	Min. forward voltage @ min. dim level	>	Min. output voltage	Only relevant for dimmable LED Driver ! **NOTICE** **To ensure full dimming performance the forward voltage of the LED module at min. dim level must be greater than or equal to the min. output voltage of the driver.** _ Determine the forward voltage of the LED module at lowest dim level _ In case there is no data available for the LED module at lowest dim level: take the min. forward voltage minus 20% as an approximation _ Check whether the forward voltage of the LED module is greater than or equal to the min. output voltage of the driver
(3) LF current ripple	Max. permissible LF current ripple	>=	Output LF current ripple (<120Hz)	_ Check whether max. permissible LF current ripple of LED module is greater than or equal to output LF current ripple of LED Driver
(4) Max. peak current	Max. permissible peak current	>	Max. output current peak	_ Check whether max. permissible peak current of LED module is greater than max. output current peak of LED Driver
(5) Power (pertinent for multi channel LED Driver)	Min. power consumption	>	Min. output power	_ Check whether power range of LED module is completely within output power range of LED Driver
	Max. power consumption	<	Max. output power	

Compatibility between LED module and LED Driver

Practical tests

CAUTION!

Following the comparison of the data sheet values a practical test is required. Only a practical test can ensure that the system components (luminaire, LED Driver , LED module, wiring) are coordinated and working properly.

The following aspects must be checked:

Technical aspects

- Transient behaviour
- Colour shift
- Connection during operation
- Parasitic capacitance

Visual aspects

- Flickering
- Stroboscopic effect (video applications)
- Dimming behaviour
- Colour change/stability
- Luminous flux

When conducting the tests the following conditions must be considered:

Conditions

- All tolerances
- Entire temperature range
- Different output voltage ranges (incl. no load)
- Entire dimming range
- Short circuit

NOTE

If the values are slightly over or under the specified threshold values or if there are any other concerns or questions please contact your 1st level technical support.

Compatibility between LED module and LED Driver

Application of the 5-point guideline

The compatibility check with the 5-point guideline is shown here using two examples.

Example 1

Comparison data for LED Driver

LED Driver	
Designation	LCA 75W 250–750mA one4all C PRE OTD
Manufacturer	TRIDONIC

Data sheet values of LED Driver	
Output current	700 mA
Output current tolerance	± 3 %
Min. output voltage	45 V (1)
Max. output voltage	107 V (1)
Output LF current ripple	± 5 %
Max. output current peak	Output current + 40 %
Output power	75.0 W

(1) Values at 700mA

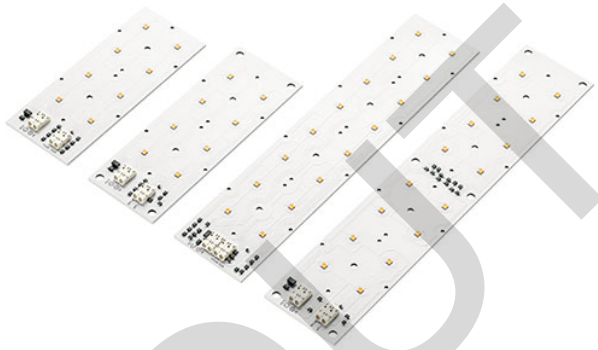
Compatibility between LED module and LED Driver

Comparison data for LED module

LED module	
Designation	RLE G1 49x223mm 4000lm 830 PL1 EXC OTD
Manufacturer	Tridonic

Data sheet values of LED module	
Forward current	700 mA
Max. DC forward current	1400 mA
Typ. forward voltage	33 V +/-10 % (1)
Min. forward voltage	43.6 V (1)
Max. forward voltage	49.8 V (1)
Max. permissible LF current ripple	1800 mA
Max. permissible peak current	2,000 mA
Power draw	32.14 W

(1) Values at 700 mA



Questions

- Is the LED Driver able to operate two modules?
- Can the required luminous flux of 3,000 lm be achieved with this combination?

Compatibility between LED module and LED Driver

Procedure

Comparison of data sheet values

Comparison of...	Value in LED module		Value in LED Driver	Result	Explanation
(1) Current	700 mA	=	700 mA	✅	_ To produce a luminous flux of 3,000 lm, the two LED modules must be operated with a forward current of 700 mA. _ The LED Driver can be set so that it delivers precisely this value of 700 mA as the output current.
	1400 mA	>=	721 mA	✅	_ The output current of the LED Driver including tolerances (700 mA + 3 % = 721 mA) is less than or equal to the max. DC forward current of the LED module (1400 mA).
(2) Voltage	87.2 V	>	45 V	✅	_ The voltage range of the LED module (2 x 43.6 V = 87.2 V; 2 x 49.8 V = 99.6 V) lies completely within the voltage range of the LED Driver (45 - 107 V).
	99.6 V	<	107 V	✅	
(3) LF current ripple	1800 mA	>	757,05 mA	✅	_ The Output LF current ripple (5 % of output current plus tolerances: [700 mA + 3 %] x 1.05 = 757,05 mA) of the LED Driver is less than the max. permissible LF current ripple of the LED module (1800 mA).
(4) Max. peak current	2000 mA	>	980 mA	✅	_ The max. output current peak of the LED Driver (700 mA + 40 % = 980 mA) is less than the max. permissible peak current with which the LED module can be operated (2,000 mA).
(5) Power	64.8 W	<	75.0 W	✅	_ The power draw of the LED module (64.8 W) is less than the output power of the LED Driver (75.0 W).

Result

All the values meet the requirements. The components are mutually compatible.
With 2 modules a luminous flux of 3,713 lm will be achieved.

Compatibility between LED module and LED Driver

Example 2

Comparison data for LED Driver

LED Driver	
Designation	LCA 75W 250–750mA one4all C PRE OTD
Manufacturer	TRIDONIC

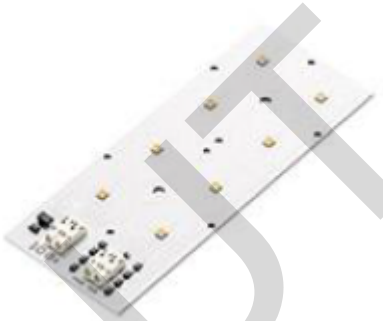
Data sheet values of LED Driver	
Output current	700 mA
Output current tolerance	± 3 %
Min. output voltage	45 V (1)
Max. output voltage	107 V (1)
Output LF current ripple	± 5 %
Max. output current peak	Output current + 40 %
Output power	75.0 W

(1) Values at 700mA

Compatibility between LED module and LED Driver

Comparison data for LED module

LED module	
Designation	Fictitious LED module
Manufacturer	Other manufacturer



Data sheet values of LED module	
Forward current	700 mA
Max. DC forward current	1,050 mA
Typ. forward voltage	39.5 V +/-10 % (1)
Min. forward voltage	35.55 V (1)
Max. forward voltage	43.45 V (1)
Max. permissible LF current ripple	630 mA
Max. permissible peak current	1,500 mA
Power draw	19.75 W

(1) Values at 700mA

Questions

- Are the two components mutually compatible?
- Can the required luminous flux of 1,800 lm be achieved with this combination?

Compatibility between LED module and LED Driver

Procedure

Comparison of data sheet values

Comparison of...	Value in LED module		Value in LED Driver	Result	Explanation
(1) Current	700 mA	=	700 mA	✅	_ To produce a luminous flux of 1,800 lm the LED module must be operated with a forward current of 700 mA. _ The LED Driver can be set so that it delivers precisely this value of 700 mA as the output current.
	1,050 mA	>=	721 mA	✅	_ The output current of the LED Driver including tolerances (700 mA + 3 % = 721 mA) is less than or equal to the max. DC forward current of the LED module (1,050 mA).
(2) Voltage	35.55 V	>	45 V	❌	_ The voltage range of the LED module (35.55 V - 43.45 V) is **not** within the voltage range of the LED Driver (45 V - 107 V)
	43.45 V	<	107 V	✅	
(3) LF current ripple	630 mA	>	757,05 mA	❌	_ The Output LF current ripple (5 % of output current plus tolerances: [700 mA + 3 %] x 1.05 = 757,05 mA) of the LED Driver is **not** less than the max. permissible LF current ripple of the LED module (630 mA).
(4) Max. peak current	1,500 mA	>	980 mA	✅	_ The max. output current peak of the LED Driver (700 mA + 40 % = 980 mA) is less than the max. permissible peak current with which the LED module can be operated (1,500 mA).
(5) Power	19.75 W	<	75 W	✅	_ The power draw of the LED module (19.75 W) is less than the output power of the LED Driver (75.0 W).

Result

One of the values **does not** meet the requirements. The components are **not** mutually compatible.

Installation notes

Practical tests

Practical tests are used to ensure fault-free operation of the LED module and LED Driver. The following aspects must be checked.

Technical aspects

- Transient behaviour
- Colour shift
- Connection during operation
- Parasitic capacitance

Visual aspects

- Flickering
- Stroboscopic effect (video applications)
- Dimming behaviour
- Colour change/stability
- Luminous flux

Conditions

When conducting the tests the following conditions must be considered:

- All tolerances
- Entire temperature range
- Different output voltage ranges (incl. no load)
- Entire dimming range
- Short circuit

NOTICE

If the values are slightly over or under the specified threshold values or if there are any other concerns or questions please contact Technical Support: techservice@tridonic.com

Installation notes

NOTICE

The cabling, wiring and mounting for a LED Driver varies depending on the design and manufacturer of the LED module. The following description should therefore not be viewed as comprehensive installation instructions but merely as important general information.

To obtain further information, proceed as follows:

- Read the documentation provided by the lamp manufacturer. Follow the guidelines and instructions of the lamp manufacturer!
- Observe all relevant standards. Follow the instructions given in the standards!

Safety information

WARNING!

- Comply with the general safety instructions (see General safety instructions, p. 5) !
- To avoid failures due to ground faults protect the wiring against mechanical loads from sharp-edged metal parts (e.g. cable penetrations, cable holders, metal frames, etc.
- LED Drivers from Tridonic are protected for a maximum of 48 hour against overvoltage of up to 320 V. Make sure that the LED Driver is not exposed to overvoltages for long periods!
- LED Driver LCA PRE OTD from Tridonic have type of protection IP 20. Comply with the requirements for this type of protection!

Installation notes

Function of the earth terminal

The earth connection is conducted as protection earth (PE). The LED Driver can be earthed via earth terminal or metal housing (if device has metal housing). If the LED Driver will be earthed, protection earth (PE) has to be used. There is no earth connection required for the functionality of the LED Driver. Earth connection is recommended to improve following behaviour.

- Electromagnetic interferences (EMI)
- LED glowing at standby
- Transmission of mains transients to the LED output

In general, it is recommended to earth the LED Driver if the LED module is mounted on earthed luminaire parts respectively heat sinks and thereby representing a high capacity against earth.

Avoiding residual LED glow on standby

Residual LED glow on standby may occur as a result of capacitive leakage currents from the LED module onto earthed luminaire parts (such as the heat sink). This mainly affects high-efficiency LED systems with large surface areas installed in luminaires with protection class 1.

The topology has been improved so that residual LED glow can be virtually eliminated by earthing the devices.

NOTICE

If the LED Driver cannot be earthed or if earthing is not desired, residual LED glow can be minimised by adequate insulation (for example by using heat-conducting double-sided insulation foil).

Avoiding the transfer of mains transients to the LED output

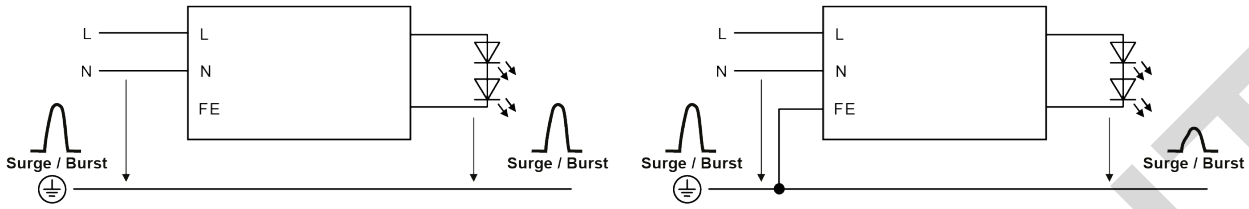
The transfer of mains transients to the LED output presents a problem for many LED Driver topologies currently on the market, and TRIDONIC devices may be affected.

Voltage peaks at the input of the LED Driver may be transferred to the output of the device where they lead to differences in potential between the LED output and earthed luminaire parts. These differences in potential may result in flashovers if the insulation is inadequate or if the creepage and clearance distances are too small. Flashovers will cause the LED module to fail.

Earthing the LED Driver attenuates voltage peaks and reduces the likelihood of flashovers. The precise degree of attenuation depends on the capacitance of the LED module with respect to earth. If voltages at the output are higher than 0.5 kV, it is mentioned in the data sheet.

Installation notes

Figure: Voltage peaks for LED driver without earthing (left) and with earthing (right)



NOTICE

Irrespective of whether the LED Driver is earthed or not, LED modules must be insulated in accordance with the requirements of the luminaire protection class. Improved insulation of the LED module can also reduce the likelihood of flashovers.

Installation notes

Routing the wires

Tests

NOTICE

The performance of the prescribed tests and compliance with relevant standards are the responsibility of the luminaire manufacturer.
The following descriptions merely indicate the most important tests and are no substitute for a full research of the relevant standards.

Insulation and dielectric strength testing of luminaires

LED Driver for lamps are sensitive to high-voltage transients. This must be taken into consideration when subjecting luminaires to routine testing during manufacture.

According to IEC 60598-1 Annex Q (for information only!) and ENEC 303-Annex A, each luminaire should be subjected to an insulation test for 1 second at 500 V DC. The test voltage is applied between the linked phase/neutral conductor terminal and the protective earth terminal. The insulation resistance must be at least 2 M.

As an alternative to measuring the insulation resistance, IEC 60598-1 Annex Q describes a dielectric strength test at 1500 V AC (or 1.414 x 1,500 V DC). To avoid damaging LED Driver, this dielectric strength test should be performed exclusively for type testing. This test should certainly not be used for routine testing.

NOTICE

Tridonic recommends performing an insulation test because a dielectric strength test may damage the device irreparably.

Type testing

Type testing of the luminaire is performed according to IEC 60598-1 Section 10.
The wiring for protection class 1 luminaires is tested at a voltage of 2xU + 1,000 V. In order not to overload the LED Driver all the inputs and outputs of the LED Driver are connected to one another.
U_{out} is used for measuring the voltage for luminaires with LED Driver with U_{out} > 250 V:
For U_{out} 480 V the voltage for the type test is 2000 V. (Routine testing is always performed at 500 V DC)

Wiring

NOTICE

The wiring procedure is device specific. Further information about wiring, wire cross sections and the length of stripped off insulation can be found in the data sheet.

Installation notes

Wiring guidelines

- The cables should be run separately from the mains connections and mains cables to ensure good EMC conditions.
- The LED wiring should be kept as short as possible to ensure good EMC. The max. secondary cable length is 2 m (4 m circuit), this applies for LED output as well as for I-select and temperature sensor.
- Depending on the design of the luminaire it may be possible to improve the radio interference properties by earthing the device at the earth connection.
- The LED Driver has no inverse-polarity protection on the secondary side. Wrong polarity can damage LED modules with no inverse-polarity protection.

Wiring the plug-in terminal

- Use solid wire or stranded wire with the correct cross-section
- Strip off correct length of insulation; you may need to twist the tool slightly
- If stranded wire is used: push onto the terminal from above to be able to insert the wire
- Insert the bare end into the terminal

Detaching the plug-in terminal

- Push onto the terminal from above to release the wire
- Pull out the wire at the front

External fuse for DC operation

The internal fuse of an LED Driver is not rated for DC operation. Because of this, an additional external fuse must be used if an LED Driver is operated on a DC network.

Proceed as follows:

- Connect the external fuse to the line labeled "+" which is between the DC power supply and the input terminal of the LED Driver
- Only use an external fuse with suitable parameters.

For LED Drivers with a power of 25-150 watts the following values are recommended:

- Rated voltage: 250 V
- DC rated power: 1 A - 3 A Time-Lag (SLO-Blo®)

Tridonic recommends the following external fuse:

- 477 Series, 5 × 20 mm, Time-Lag (Slo-Blo®) Fuse Rating 3.15 A

Installation notes

Maximum loading of circuit breakers

Importance of maximum loading

A circuit breaker is an automatically operated electrical switch that protects an electrical circuit from damage caused by overload or short circuit. Unlike a fuse that must be replaced if it triggers, a circuit breaker can be reset (either manually or automatically) and used further. Circuit breakers are available in different sizes and with different technical data.

The inrush current is a short increased peak current that occurs when an electronic control gear is switched on.

In electrical installations, numerous control gear are connected to one circuit breaker. The maximum loading of a circuit breaker indicates how many control gear can be connected to the circuit breaker without triggering the circuit breaker because of the summation of the different inrush currents. The value is calculated through simulation programs based on the circuit breakers characteristic.

Information about the maximum loading can be found in Tridonic data sheets. The following table shows the data for LCA 60W 350-1050mA one4all PRE OTD as an example.

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20	Inrush current	
Installation Ø (in mm^2)	1,5	1,5	2,5	4	1,5	1,5	2,5	4	I_{max}	time
LCA 60W 350-1050mA one4all PRE OTD	11	16	20	25	7	10	12	15	32 A	267 µs

Calculation of maximum loading

Tripping characteristics of circuit breakers

The load at which a circuit breaker triggers is defined by the height and the duration of the applied current.
The following table shows exemplary values for different circuit breakers (B10, B13, B16, B20).

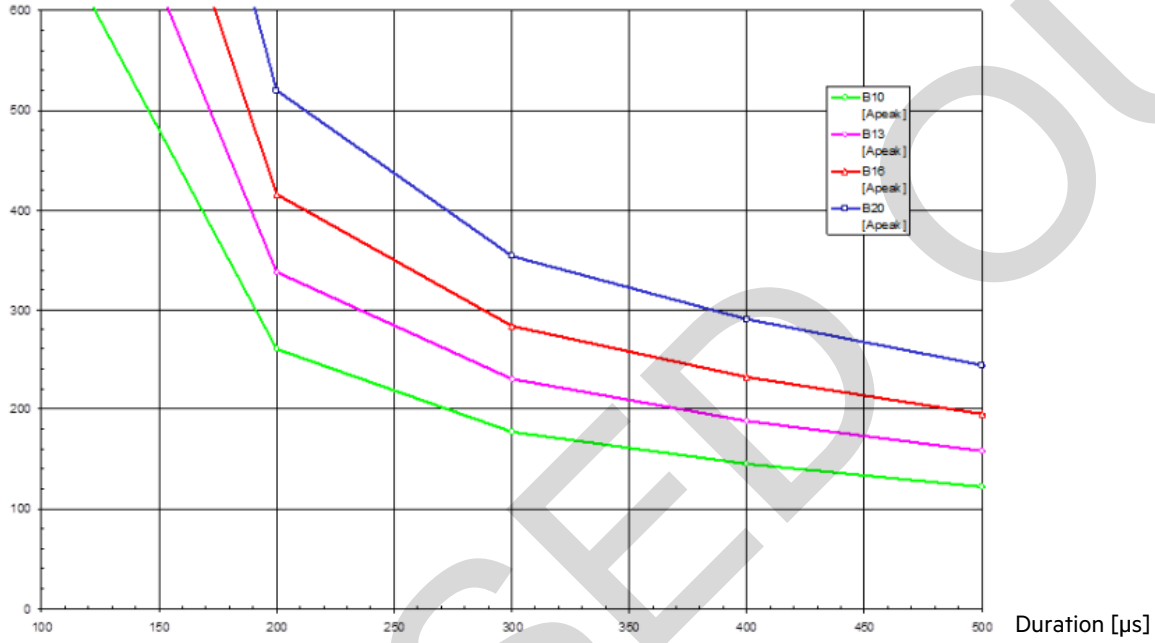
Duration [µs]	Current B10 [A_{peak}]	Current B13 [A_{peak}]	Current B16 [A_{peak}]	Current B20 [A_{peak}]
100	700	910	1,120	1,400
200	260	338	416	520
300	177	230.1	283	354
400	145	188.5	232	290
500	122	158.6	195	244
600	110	143	176	220
700	102	132.6	163	204
800	97	126.1	155	194

Installation notes

900	93	120.9	149	186
1000	90	117	144	180

The combination of both parameters can also be displayed graphically. This results in the tripping characteristic for a certain circuit breaker.

Current [A]



Duration [µs]

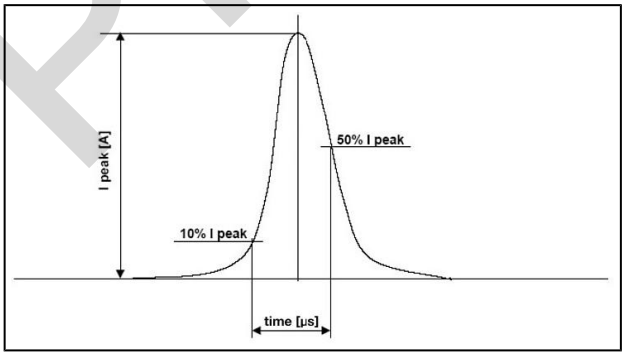
NOTICE

Information about the specific tripping characteristics of a circuit breaker must be requested from the respective manufacturer !

Calculation of the inrush current

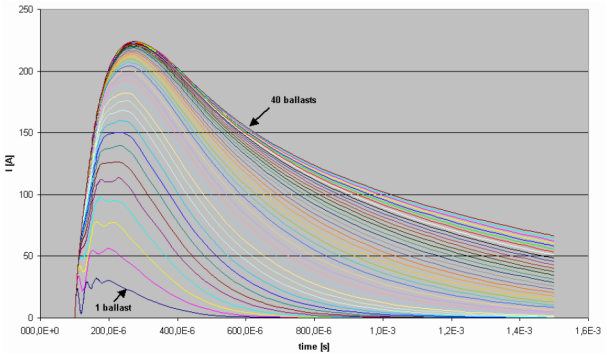
The inrush current of a control gear is also defined by its duration and its height. The duration is typically measured as the time between 10 % of maximum current (ascending) and 50 % of maximum current (descending).

The following illustration shows the inrush current of a single control gear:



Installation notes

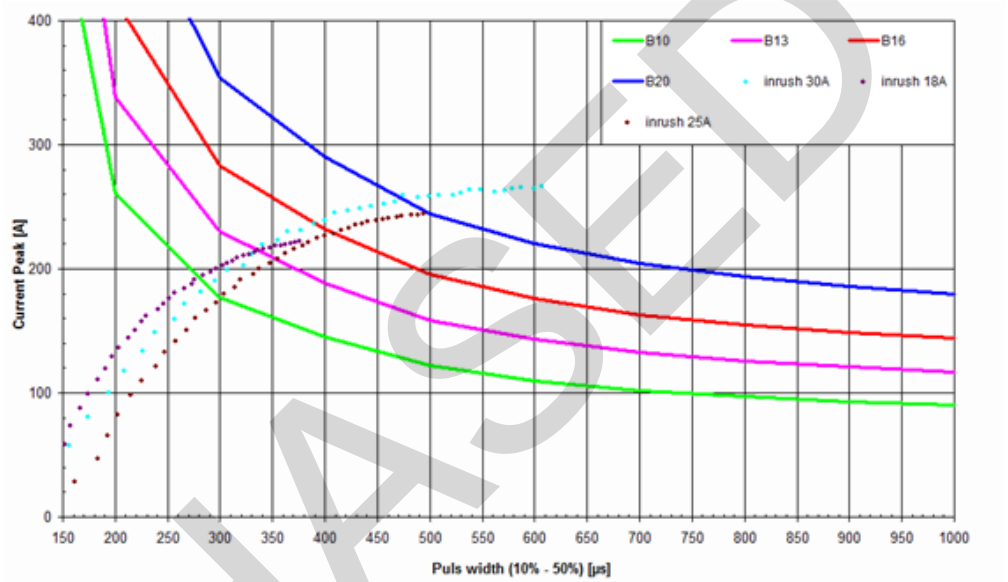
If several control gear are connected to one circuit breaker, the individual inrush currents add up.



Implementation of the simulation

The above-mentioned parameters, height and duration of the current pulse in both the circuit breaker and the control gear, are entered into the simulation program.

The result of the simulation is presented in graphical form.



The different elements have the following meaning:

- Circuit breaker:
  B10, B13, B16, B20 (solid line) represent the tripping characteristics of different circuit breakers.
- Inrush current:
  The dotted lines represent different inrush currents.
  The index of a point signifies the number of control gear, that is, point 1 represents the result for 1 control gear, point 2 the result for 2 control gear, etc.

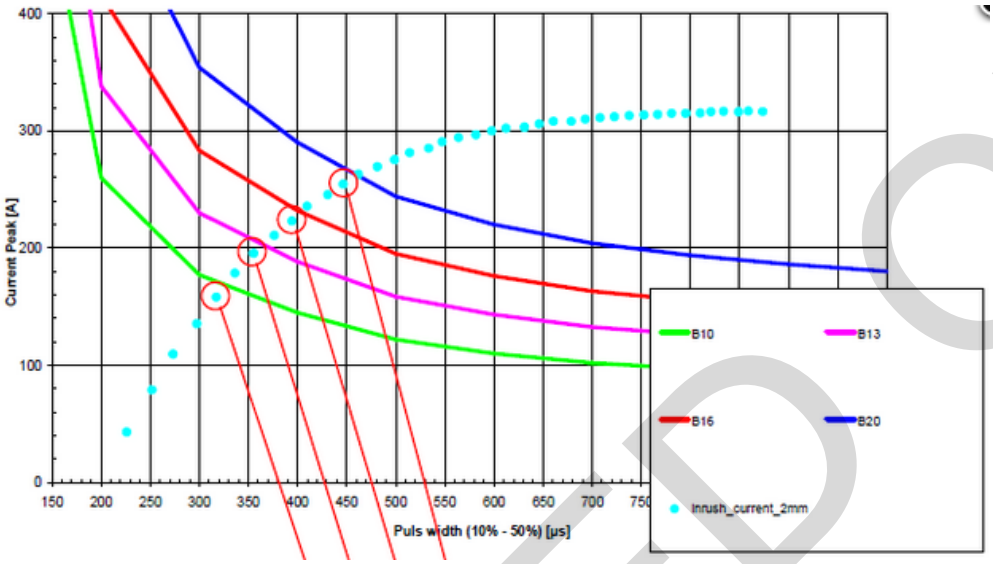
The simulation results can be read as follows:

- The crossing of the two lines shows the maximum value for the selected combination of circuit breaker and inrush current.
- The index of the point at this maximum value shows the max. number of control gear.

Installation notes

The following example shows the maximum number of control gear at four different circuit breakers:

- max. 5 devices at circuit breaker B10 (green tripping characteristic)
- max. 7 devices at circuit breaker B13 (pink tripping characteristic)
- max. 9 devices at circuit breaker B16 (red tripping characteristic)
- max. 12 devices at circuit breaker B20 (blue tripping characteristic)



NOTICE

The results of different simulations can only be compared if all of the relevant factors are the same. The following points can influence the results:

- Tripping characteristic used for the circuit breakers
- Definition used for the duration of the inrush current (Tridonic: 10-50 %)
- Gear used for the measurement of the inrush current (especially important: Which electrolytic capacitor is installed in the control gear?)
- Considering a safety buffer (Tridonic: +20 % for the electrolytic capacitor)
- Considering different system impedance
- Switch-on point used: should always be at max. input voltage
- Adopted cable lengths and cable data (Tridonic: Cable length 40 cm; Resistivity: 0.0172 * mm^2 / m; inductance: 5 nH / cm; terminal resistance: 2 m)
- The modeling of the control gear is performed from the input to the bus voltage electrolytic capacitor . For inductance the saturation values must be used.

Functions

corridorFUNCTION V2

Description

The corridorFUNCTION enables the illuminance to be linked to the presence or absence of people. A conventional relay motion sensor is connected. The luminous intensity is increased when a person enters the room. When the person leaves the room the motion sensor switches off after a certain delay and the luminous intensity is automatically reduced.

The corridorFUNCTION is particularly beneficial in applications in which light is needed round the clock for safety reasons, for example in public buildings, large apartment complexes, car parks, pedestrian underpasses and underground railway stations. Since the luminous intensity only has to be increased when there is a demand for light, the corridorFUNCTION offers effective lighting management and helps saving energy and costs. Another benefit of the corridorFUNCTION is the enhanced convenience of automatic lighting control.

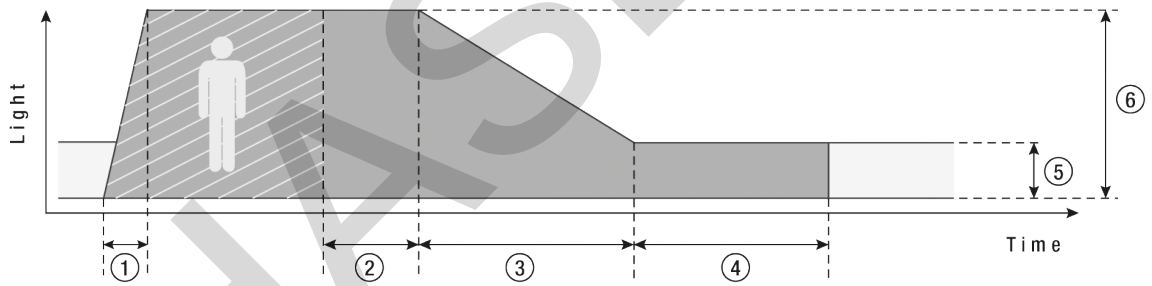
⚠ CAUTION!

To ensure correct operation a sinusoidal mains voltage with a frequency of 50 Hz or 60 Hz is required at the control input. Special attention must be paid to achieving clear zero crossings. Serious mains faults may impair the operation of switchDIM and corridorFUNCTION.

Profile settings:

Standard profile for activating via 230V on the interface terminal DA/N - DA/L for 5 minutes is **"Never off"**

The LED Drivers have different profiles so they can provide the best possible performance in a range of conditions. The profiles are defined by a series of values:



1. Fade-in time: the time that starts as soon as the presence of a person is detected. During the fade-in time the luminous intensity is faded up to the presence value (default: 0s).
2. Run-on time: the time that starts as soon as the presence of a person is no longer detected. If the presence of a person is detected again during the run-on time the run-on time is restarted from zero. If no presence is detected during the run-on time the fade time is started as soon as the run-on time expires.
3. Fade time: the time during which the luminous intensity is faded from the presence value to the absence value (default: 30s).
4. Switch off delay: the time during which the absence value is held before the lighting is switched off. Depending on the profile selected the switch-off delay may have different values or may not be defined (default: "Never Off").
5. Absence value: the luminous intensity when there is no person present (default: 10 %).
6. Presence value: the luminous intensity when persons are present (default: 100 %).

Functions

Variable switch-off times

The profiles and their values can be freely adjusted. The values can be adjusted via a connection to a DALI bus.

Commissioning

Activating the corridorFUNCTION

Activating the corridorFUNCTION by means of the mains voltage

Activating the corridorFUNCTION is simple. If an a.c. voltage of 230 V is applied to the digital interface of the LED Driver for a period of at least 5 minutes the LED Driver detects the corridorFUNCTION and automatically activates it. Activation is required only once per device.
There are three procedures for activating by the mains voltage. The requirements are the same in each case.

Requirements:

- The LED Driver is correctly installed in the luminaire
- Input voltage is applied
- A motion sensor is connected to information DA/N or DA/L

Procedure Version 1:

- Remain in the activation range of the motion sensor for more than 5 minutes
  -> The motion sensor detects movement and switches on
  -> The corridorFUNCTION is activated automatically after 5 minutes
  -> The light value switches to presence level (default: 100 %)

Procedure Version 2:

- Set the run-on time on the motion sensor to a value greater than 5 minutes
- Remain in the activation range of the motion sensor for a short time
  -> The motion sensor detects movement and switches on
  -> The corridorFUNCTION is activated automatically after 5 minutes
  -> The light value switches to presence value (default: 100 %)
- Reset the run-on time of the motion sensor to the required value

Procedure Version 3: Only possible if the motion sensor offers a manual override option

- Set the slide switch on the motion sensor to the "Never-Off" function
- Wait 5 minutes
  -> The corridorFUNCTION is activated automatically after 5 minutes
  -> The light value switches to presence value (default: 100 %)
- Reset the slide switch on the motion sensor to the "automatic" function

Activating the corridorFUNCTION via the masterCONFIGURATOR

The corridorFUNCTION can also be activated via the masterCONFIGURATOR.
Further information can be found in the masterCONFIGURATOR manual (see Reference list, p. 56).

Functions

Activating the corridorFUNCTION via ready2mains

The corridorFUNCTION can also be activated via ready2mains.
Further information can be found in the Product manual ready2mains Programmer (see Reference list, p. 56).

Activating the corridorFUNCTION via U6Me2

The corridorFUNCTION can also be activated via U6Me2.
Further information can be found in the "Technical information U6Me2 programming" (see Reference list, p. 56).

Deactivating the corridorFUNCTION

If the corridorFUNCTION is activated the LED Driver is controlled only by motion. To operate the LED Driver via DALI, DSI or switchDIM the corridorFUNCTION must be deactivated.

Deactivating the corridorFUNCTION via mains

- Connect mains voltage push button to the terminal marked DA/L
- Connect neutral conductor to the terminal marked DA/N
- Press the push button 5 times within 3 seconds

Deactivating the corridorFUNCTION via masterCONFIGURATOR

If the corridorFUNCTION was activated via the masterCONFIGURATOR, it can also be deactivated via the masterCONFIGURATOR.
Further information can be found in the masterCONFIGURATOR manual (see Reference list, p. 56).

Adjusting the values of the corridorFUNCTION

The values of the corridorFUNCTION can be individually adjusted. The values are set via a DALI USB on the bus and by entering special DALI commands, ready2mains commands or U6Me2 commands.
Further information can be found in the masterCONFIGURATOR manual (see Reference list, p. 56).

Functions

Installation

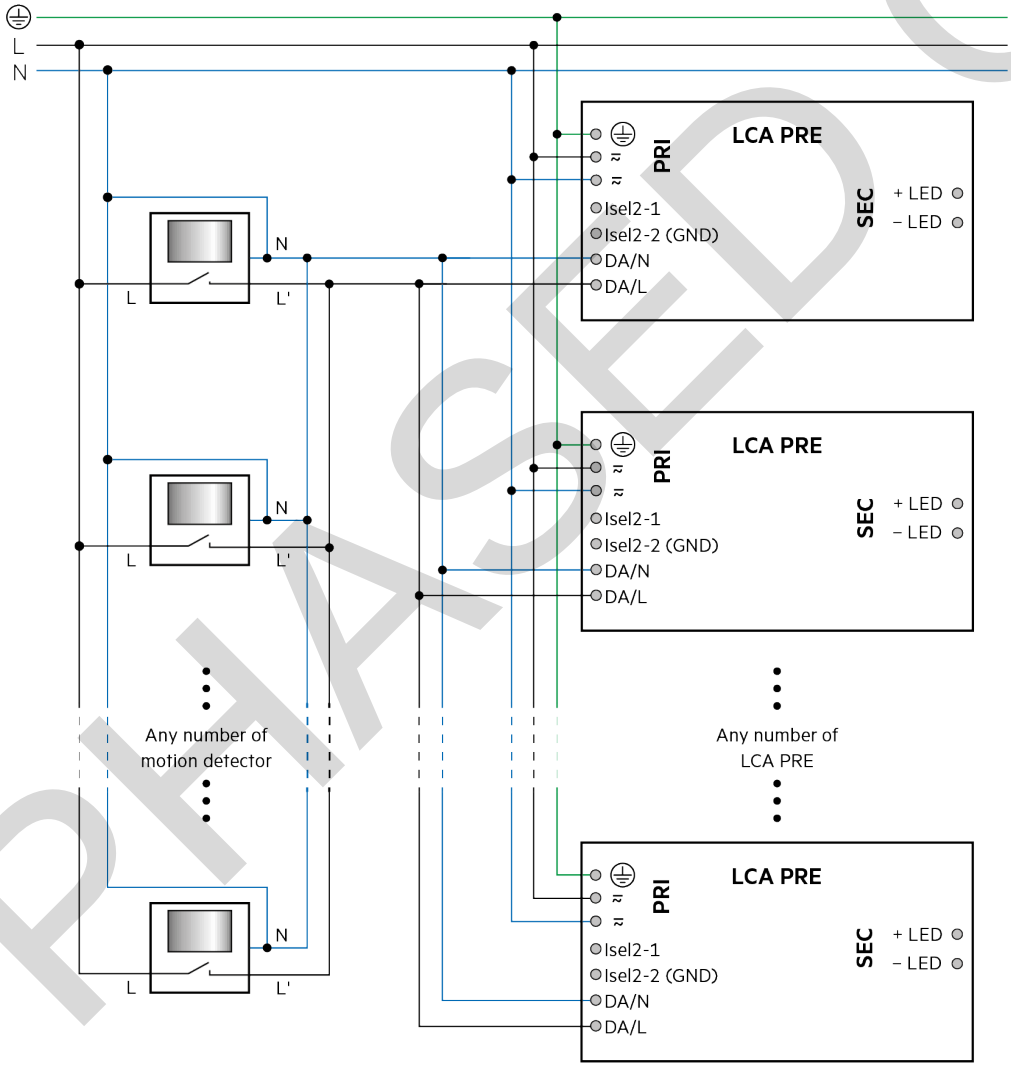
Requirements:

- The LED Driver is correctly installed in the luminaire and cabled on the power supply side
- A motion sensor is installed in the lighting system
- The motion sensor is connected to the LED Driver

Procedure:

- Connect the neutral wire (N) to terminal DA/N on the LED Driver
- Connect the output of the motion sensor (switched phase) to terminal DA/L on the LED Driver

Wiring versions:



Functions

Benefits:

Control can be changed at any time to a digital control signal (DSI or DALI) without having to change the luminaire or provide an additional control line

CAUTION!

Use conventional relay motion sensors!
Electronic motion sensors (Triac) are not suitable because of their technical design.

CAUTION!

Do not use glow switches!
Glow switches may affect the control.

CAUTION!

Make sure that the control line (L') of the motion sensor is connected to terminal DA/L and the neutral wire (N) to terminal DA/N.

CAUTION!

For five-pole wiring the neutral wire must be connected to DA/N.
This prevents 400 V being applied between adjacent terminals if a different phase is used for the control input.

NOTICE

For large installations, supply to the LED Driver may be split among several phases (L1, L2, L3).
Any phase can be used for the control input.
Any number of motion sensors can be connected in parallel.

Functions

DSI

Description

DSI (Digital Serial Interface) enables DSI LED Driver to be controlled. The DSI line can be wired separately via a two-core cable or together with the mains cable in a five-core cable. Communication is not impaired by the mains cable. In contrast to DALI, there is no individual addressing of the LED Drivers with DSI.

DSI offers a series of benefits:

- Expansion options via submodules, for example in combination with daylight control or additional switch modules
- Wiring: Simple wiring with five pole standard cables and line length of up to 250 meters
- Wiring: Polarity-free control lines can be used for mains and control lines
- Wiring: Multiple wiring possibilities (star, series and mixed wiring)
- Unaffected by electrical interference
- Uniform light level from the first to the last light source
- reverse polarity protected connection: can be connected with any polarity

The main benefits of DSI are the optimization of energy consumption of extensive groups of luminaires (e.g. in sports stadiums and factories).

Commissioning

NOTICE

If the corridorFUNCTION is activated, the LED Driver is controlled only by motion. To operate the LED Driver via DALI, DSI or switchDIM, the corridorFUNCTION must be deactivated.

Further information can be found in the DALI Handbook (see Reference list, p. 56).

Functions

switchDIM

Description

With the switchDIM function it is possible to use the mains voltage as a control signal.
The phase of a simple standard mains voltage push button is connected to the terminal marked DA/L and the neutral conductor is connected to the terminal marked DA/N.

Using the function is easy and convenient:

- A short press (50-600 ms) switches the device on or off
- A long press (> 600 ms) fades the connected operating device alternately up and down (between 1 and 100 %).

switchDIM is therefore a very simple form of lighting management. It also has a positive effect on material and labor costs.

The device has a switchDIM memory function. This is used, among other things, for storing the last dimming value in the event of interruptions in the power supply.
When power returns, the LED is automatically restored to its previous operating state and dimmed to the last value.

⚠ CAUTION!

Glow switches are not approved for controlling switchDIM.
Glow switches may cause the LED Driver to spontaneously switch on or off or make sudden changes in the dimming value.

⚠ CAUTION!

To ensure correct operation a sinusoidal mains voltage with a frequency of 50 Hz or 60 Hz is required at the terminal.
Special attention must be paid to achieving clear zero crossings. Serious mains faults may impair the operation of switchDIM and corridorFUNCTION.

⚠ CAUTIONS!

A maximum number of 25 operating devices per switchDIM system should not be exceeded.
If you have more devices, please use DALI or DSI.

Commissioning

ⓘ NOTICE

If the corridorFUNCTION is activated, the LED Driver is controlled only by motion. To operate the LED Driver via DALI, DSI or switchDIM, the corridorFUNCTION must be deactivated.

Using the switchDIM function

switchDIM is operated by the mains voltage push button.

Functions

Procedure:

- Switch the device on/off by briefly actuating the push button -or-
- Dim the device by holding down the push button

Synchronising devices

If the devices in a system do not operate synchronously, the devices must be synchronized, i.e. put in the same status (on/off).

Procedure:

- Hold down the push button for 10 seconds
  -> All devices will be synchronized to the same status
  -> LEDs will will be set to a uniform light value (approx. 50 %)
  -> The fading time will be set to its default value (approx. 3 seconds)

Changing the fading time

The default value for the fading time is approx. 3 seconds. It can be changed to approx. 6 seconds.

Procedure:

- Hold down the push button for 20 seconds
  -> After 10 seconds: all devices will be synchronized to the same status
  -> After 20 seconds: a fading time of approx. 6 seconds will be set
  -> LEDs will be set to a uniform light value (approx. 100 %)

Switching the LED Driver to automatic mode

In automatic mode the device detects which control signal (DALI, DSI, switchDIM, etc.) is connected and automatically switches to the corresponding operating mode.

Procedure:

- Press the push button 5 times within 3 seconds

Installation

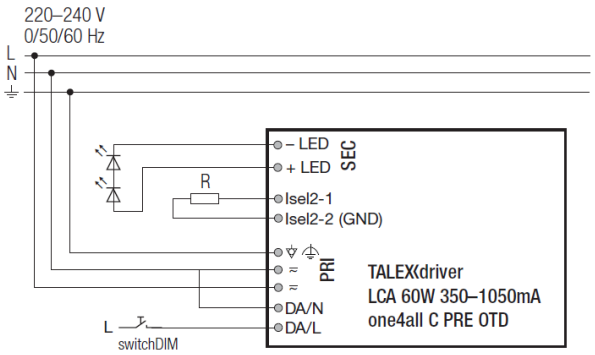
Wiring variants

There are two options for installing switchDIM: four-pole and five-pole wiring

Functions

Four-pole wiring

Configuration:



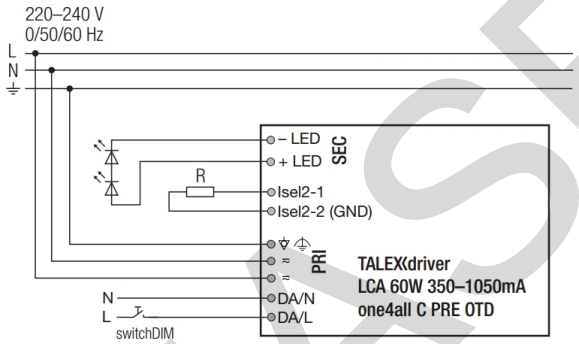
Phase (L), neutral (N), earth (PE), control line (L')

Benefits:

No need for a control line thanks to bridging terminal DA/N and the N-connection of the luminaire

Five-pole wiring

Configuration:



Phase (L), neutral (N), earth (PE), control line (L'), control line neutral (N')

Benefits:

Control can be changed at any time to a digital control signal (DSI or DALI) without having to change the luminaire or provide an additional control line.

⚠ CAUTION!

For five-pole wiring the neutral conductor must be connected to DA/N.
This prevents 400 V being applied between adjacent terminals if a different phase is used for the control input.

Functions

Power-up Fading

Description

The power-up fading function offers the opportunity to realize a soft start. The soft start will be applied when the mains supply is switched on and during operation with switchDIM. The function is programmed as a DALI fade time in the range from 0.7 to 16 seconds and dims in the selected time from 0 percent to the power-on level.

By factory default power-up fading is not active (0 seconds).

Commissioning

Procedure via the masterCONFIGURATOR

- Open dialog box "Tridonic-specific configuration"
- Click tab "Power-up Fading"
- Choose value from drop-down menu "Power-up Fading"
- Click "save"
  Changes are saved

Further information can be found in the masterCONFIGURATOR manual (see Reference list, p. 56).

Functions

DALI

Description

DALI standard

NOTICE

LCA PRE devices support the new DALI standard V2 (according to EN 62386-102).

DALI (Digital Addressable Lighting Interface) is an interface protocol for digital communication between electronic lighting equipment.

The DALI standard was developed by Tridonic together with renowned manufacturers of operating and control equipment. Today, these manufacturers belong to the DALI Activity Group which promotes the use and further development of DALI.

The DALI standard is defined in IEC 62386. A test procedure standardized by the DALI Activity Group ensures compatibility between products from different manufacturers. Tridonic products have undergone this test and meet all the requirements. This is indicated by the logo of the DALI Activity Group on the device.

The agreement by the lighting industry to adopt a common protocol has opened up a virtually unlimited number of options. With the right choice of individual DALI components an extremely wide range of requirements can be met, from operating a simple light switch to lighting management systems for entire office complexes with thousands of light sources.

DALI in Action

DALI offers a lot of possibilities:

- DALI line: 64 control gear can be grouped to a line
- DALI groups: Every control gear can be attributed into 16 groups
- Addressability: All control gear are individually addressable
- Grouping: Possible without complicated rewiring
- Programmability: Individual programmability makes it possible to use functions which transcend the DALI standard
- Monitoring: Easily possible thanks to status feedback
- Wiring: Simple wiring with five pole standard cables and a cable length of max. 300 metres
- Wiring: Polarity-free control lines can be used for mains and control lines
- Wiring: Multiple wiring possibilities (star, series and mixed wiring)
- Unaffected by interruptions: All luminaires receive the same, unaffected digital signal and dimming level
- Similar light level from first to last luminaire

Technical data of a DALI line:

- DALI voltage: 9.5 V - 22.4 DC
- Maximum DALI system current: max. 250 mA
- Data transfer rate: 1200 Baud
- Maximum line length: up to 300 m (for 1,5 mm^2)

Functions

Commissioning

NOTICE

If the corridorFUNCTION is activated the LED Driver is controlled only by motion. To operate the LED Driver via DALI, DSI or switchDIM the corridorFUNCTION must be deactivated.

Further information can be found in the DALI Handbook (see Reference list, p. 56).

eD

eD ("enhanced DALI") offers extended DALI commands. They can be used to activate specific commands of the LED Driver. The masterCONFIGURATOR software works with eD commands. These commands are Tridonic specific. They are not part of the DALI standard and are not publicly available.

Functions

ready2mains

Description

ready2mains uses the mains cable to transmit information: easily, reliably and professionally.

Luminaires are controlled and dimmed directly via the mains, with no need for any additional wiring. ready2mains can be used to configure both drivers with a separate communication interface as well as fixed output drivers. The configuration saves time and is very flexibel. ready2mains reduces production costs and installation costs and also reduces possible sources of error.

Dimming

ready2mains allows for mains-based group dimming, controlled via the ready2mains protocol and appropriate dimming interfaces. For details on the operation of ready2mains and its components see the relevant technical information.

- Easy refurbishment of dimmable and non-dimmable installations
- No rewiring within the ceilings
- Allows cost-effective solutions

Configuration

The ready2mains interface can be used to configure the main parameters of LED Drivers via the mains wiring (LED output current, CLO and DC level). These parameters can be adjusted either via ready2mains-capable configuration software or directly via the ready2mains programmer (output current only). Further information can be found in the Leaflet ready2mains (see Reference list, p. 56).

- Easy configuration of luminaires
- Simple integration in existing test setups

Functions

Constant Light Output

Description

The light output of an LED module reduces over the course of its life. The Constant Light Output function compensates for this natural decline by constantly increasing the output current of the LED Driver throughout its life. As a results, a virtually uniform light output is achieved at all times.

For configuration purposes the expected module-specific values for lifetime and residual luminous flux must be specified. The output current is then controlled automatically on the basis of these values.
The LED Driver typically starts with an output current ("Required Intensity") that corresponds to the expected residual luminous flux and calculates the increase in the value on the basis of the anticipated lifetime.

If the OTL function is enabled, visual feedback is given as soon as the LED exceeds the expected LED lamp life. If the expected LED lamp life is exceeded, the luminaire flashes for 2 seconds after being switched on.

Commissioning

Procedure via the masterCONFIGURATOR

NOTICE

To be able to adjust the parameters "Required intensity", "LED burning hours" and "Expected LED life", the "Advanced settings" must be activated.
Further information can be found in the masterCONFIGURATOR manual (see Reference list, p. 56).

Activating the Constant Light Output function

- Open dialog box "Tridonic-specific configuration"
- Click tab "CLO and OTL"
- Set drop-down menu "Constant intensity" to "enabled"
- Click "save"
  Changes are saved

Activating the Over the Lifetime function

- Open dialog box "Tridonic-specific configuration"
- Click tab "CLO und OTL"
- Set drop-down menu "Visual feedback" to "enabled"
- Click "save"
  Changes are saved

Functions

Setting Required intensity and Expected LED life

- Open dialog box "Tridonic-specific configuration"
- Click tab "CLO and OTL"
- Enter values in input fields "Required intensity" and "Expected LED life"
- Click "save"
  Changes are saved

Transferring existing values to a new control gear

If a LED Driver is replaced the existing parameter values can be transferred to the new LED Driver.

- Chose a LED Driver that is in the same room as the new LED Driver
- Open dialog box "Tridonic-specific configuration"
- Click tab "CLO and OTL"
- Note down the values for "Required intensity", "LED burning hours" and "Expected LED life"
- Close dialog box "Tridonic-specific configuration"
- Chose the new LED Driver
- Open dialog box "Tridonic-specific configuration"
- Click tab "CLO and OTL"
- Take the noted values and enter them in the input fields "Required intensity", "LED burning hours" and "Expected LED life"
- Click "save"
  Changes are saved

Replacing the LED module

If an LED module is replaced, the parameter "LED burning hours" must be set to "0".

- Open dialog box "Tridonic-specific configuration"
- Click tab "CLO and OTL"
- Delete value from input field "LED burning hours"
  CLO function is automatically restarted
  Changes are saved

Further information can be found in the masterCONFIGURATOR manual (see Reference list, p. 56).

Functions

DC recognition

Description

In emergency light systems with central battery supply the DC recognition function uses the input voltage to detect that emergency mode is in place. The LED Driver then automatically switches to DC mode and dims the light to the defined DC level. Without DC recognition different and more complex solutions need to be applied in order to detect emergency mode.

LED Drivers of the LCA PRE series are factory preset to a DC level of 15 %. This value can be customized.

Further information can be found in the masterCONFIGURATOR manual (see Reference list, p. 56).

NOTICE

The LED Driver is designed to operate on DC voltage and pulsing DC voltage.
In DC recognition connected sensors are ignored.

Functions

Dimming on DC

Description

If Dimming on DC is activated the requirements of the DC recognition function are ignored. Even if DC is detected, the LED Driver continues to behave as in AC mode:

- The present dimming level is retained
- An emergency light level defined for the DC recognition function (DC level) is ignored
- Control signals via DALI and DSI continue to be executed

Commissioning

⚠ WARNING!

If Dimming on DC is activated, the emergency mode is not recognised. The device no longer automatically switches to the emergency light level.
Make sure that if Dimming on DC is activated an appropriate dimming level is selected for the emergency lighting mode.

Please also note the following:

- Dimming on DC may only be activated by trained personnel
- A security code must be entered before activation
- The security code is issued only after a consent form has been signed
- Dimming on DC must not be used in emergency lighting systems according to EN 50172

Procedure with masterCONFIGURATOR

Further information can be found in the masterCONFIGURATOR manual (see Reference list, p. 56).

Functions

Intelligent Temperature Guard

WARNING!

The t_c temperature is the maximum permitted temperatur in terms of safety. Operating the LED Driver above the permitted t_c temperature is not compliant with relevant standards!
The Intelligent Temperature Guard function does not replace the proper thermal design of the luminaire and does not enable the lighting to operate for lengthy periods of time in impermissible ambient temperatures.

Description

The Intelligent Temperature Guard function provides protection against temporary thermal overloads. Thermal overload protection is triggered if the t_c temperature is exceeded. This way, instant failure of the LED Driver can be prevented.

Behaviour

The following table shows the exact behaviour and parameters of the Intelligent Temperature Guard function.

	LCA OTD
Start of power reduction	When maximum t_c temperature is exceeded. (1) **NOTICE** The temperature at which the power reduction starts is device-specific and depends on the load and the installation situation. Depending on the installation situation and the load of the device, the temperatures at different measuring points of the device may differ. As a result, it may happen that the actual measured temperature is not identical to the temperature at the t_c point. In any case, the starting point of the power reduction is higher than the predetermined maximum t_c temperature. For the functioning of the protective function these deviations are not decisive. The starting point of the power reduction is selected by the device in a way that the protective function starts when the rated life time would otherwise be significantly affected.
Type of power reduction	Power reduction takes place in gradual steps.

Functions

Power reduction process and control	Power reduction is dependent on temperature: _ Power reduction continues if temperature still rises _ Power reduction stops if temperature does not rise anymore or if maximum power reduction is reached (minimum power level = 50 %) _ If temperature falls below a certain level, power is increased again until 100 % is reached _ If temperature still rises even if maximum power reduction is reached: _ Drivers go to 15 % dim level
Min power level	ca. 50 % dimming level
Shut off behavior	No shut off behavior: Device will not shut off if temperature still rises. AC mode: Device switches to 50 % dimming level DC mode: Intelligent Temperature Guard is not relevant because driver goes to EOFx level anyway
Automatic restart behavior	No automatic restart behavior (because there is no shut off behavior) Device stays at 50 % dimming level
Restart temperature	No restart temperature

(1) Rated t_c is device specific.

NOTICE

The standard setting for the dimming curve is logarithmic:
If alternative dimming curves are used the power reduction can be implemented differently.

Functions

Intelligent Voltage Guard

Description

The Intelligent Voltage Guard (IVG) function warns of possible damage due to overvoltage or undervoltage. Mains voltage is constantly monitored and appropriate responses are then made:

- If the mains voltage is too low (< 70 V), the LED Driver is switched off
- At undervoltages between 70 and 140 V, the LED Driver switches off and on again on a non-cyclic basis.
- In the case of overvoltage (> 318 V), the device sends feedback via DALI

One of the main causes for overvoltage is a wiring fault or a break in the neutral conductor in the three-phase network. By indicating overvoltage, Intelligent Voltage Guard also helps detecting these problems.

WARNING!

Continuous operation (approx. 1 hour) at overvoltage (> 320 V) will destroy the LED Driver.
If the device flashes, disconnect the entire lighting system circuit.

NOTICE

If overvoltage is detected, the connected sensors are ignored.

Functions

Surge Burst protection

Description

In the case of protection against overvoltage, it is decisive between which connections the overvoltage occurs. Lightning strikes cause an overvoltage between the live power lines and the ground. LED Drivers from Tridonic offer a protection of 10 kV and meet protection classes I and II according to standard IEC 61000-4-5. This means safety for the LED module and the LED Driver.

With a protection of 10 kV, lightning can strike up to approx. 150 m away from the lighting pole without damaging the module. This means that with LCA PRE OTD drivers 5 out of 10 luminaires are protected. Compared to this, with a 6 kV protection only 1 out of 10 luminaires are protected.

This better protection has clear advantages:

- Fewer luminaires must be serviced or replaced
- Therefore, maintenance costs are lower

Bursts

According to Standard IEC 61547 Ed. 2.0 (2009) tests are conducted according to IEC 61000-4-4, with test levels as given in Tables 4 to 6.
Fast transients with positive and negative polarity are applied to the device for a minimum of 2 minutes each.

Surges

Tests are conducted according to IEC 61000-4-5, with test levels as given in Table 10 of this standard. Pulses shall be applied to the a.c. voltage wave as follows:

- five positive polarity pulses at the 90° phase angle
- five negative polarity pulses at the 270° phase angle

Two test levels are given for different types of lighting equipment.

Surge Burst protection (values)

The 30 W, 60 W and 75 W versions of LCA PRE OTD have the following Surge Burst protection:

- Mains surge capability (between L – N) 6 kV / 3 kA (6 L-N according to EN 61000-4-5. 2 Ohm, 1.2/50 µs, 8/20 µs)
- Mains surge capability (between L/N – PE) 6 kV
- Mains surge capability (between L/N – PE) without DALI connection up to 10 kV
- Burst protection 6 kV

The 120 W and 160 W versions of LCA PRE OTD have the following Surge Burst protection:

- Mains surge capability (between L – N) 6 kV / 3 kA (6 L-N according to EN 61000-4-5. 2 Ohm, 1.2/50 µs, 8/20 µs)
- Mains surge capability (between L/N – PE) 6 kV
- Mains surge capability (between L/N – PE) without DALI connection up to 10 kV
- Burst protection 6 kV

Functions

chronoSTEP

Description

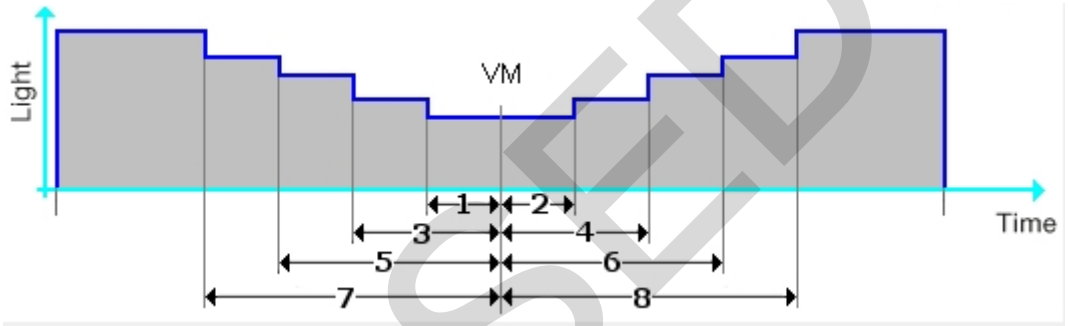
In the outdoor lighting and street lighting sector, it often makes sense to dim the lighting level during the night hours in order to save energy. The chronoSTEP V2 function is a tool that makes this easy to do.

The LED Driver automatically measures the switch-on and switch-off times of the lighting installation over the past three days. The switch-on and switch-off times are typically the times at which the sun sets and rises. The midpoint of these two reference points is the time referred to as Virtual Midnight. To allow immediate operation in the first night, it is possible to program the Virtual Midnight manually.

The overall time between switch-ON and switch-OFF is called On-Time.

Overall there are 8 profiles, 5 are predefined by factory and 3 can be programmed by the customer using the mains programming protocol U6Me2. Via U6Me2 it is possible to set profiles and output current and to reset the profile values. Programming is also possible via DALI or ready2mains.

Profiles:



Default profile: Profile 1

Profile 0 - Light output is set to 100 %, chronoSTEP deactivated
Profile 1 - Factory default if chronoSTEP mode is activated
Profile 1-4 predefined
Profile 5-8 user defined and programmable

Programming via ready2mains und DALI

More information can be found in the chronoSTEP 2 instruction manual (see Reference list, p. 56).

NOTICE

The MAX plug, which can be used for LED Drivers of the PRE series, serves as a deactivation plug (CHRO OFF) for LED Drivers of the OTD series and deactivates the chronoSTEP function.

Reference list

Additional information

- Web page PREMIUM Outdoor series:
  http://www.tridonic.com/com/en/products/premium-outdoor-series.asp
- Data sheets: Go to above web page link and click "Products" > "Downloads" > "Data sheet"
- Accessories: Go to above web page link and click "Products" > "Downloads" > "Accessories"
- DALI manual:
  http://www.tridonic.com/com/en/download/technical/DALI-manual_en.pdf
- Documentation masterCONFIGURATOR:
  http://www.tridonic.com/com/en/download/Manual_masterConfigurator_en.pdf
- Leaflet Outdoor:
  http://www.tridonic.com/com/en/download/brochures/Leaflet_Outdoor_EN_web.pdf
- Leaflet ready2mains:
  http://www.tridonic.com/com/en/download/brochures/Leaflet_ready2mains_EN_web.pdf
- Product manual ready2mains Programmer:
  http://www.tridonic.com/com/en/download/technical/ready2mains_Programmer_ProductManual_en.pdf
- Technical information U6Me2 programming:
  http://www.tridonic.com/com/de/download/technical/chronoSTEP_Manual_en.pdf
- Web page corridorFUNCTION:
  http://www.corridorfunction.com/corridorFUNCTION/index.html
- chronoSTEP 2 Instruction manual, U6Me2 programming:
  http://www.tridonic.com/com/en/download/technical/chronoSTEP_Manual_en.pdf

Downloads

- Tridonic software:
  http://www.tridonic.com/com/en/software.asp
- Download masterCONFIGURATOR:
  http://www.tridonic.com/com/de/software-masterconfigurator.asp

Reference list

Technical data

- Data sheets:
  http://www.tridonic.com/com/en/data-sheets.asp
- Company certificates:
  http://www.tridonic.com/com/en/company-certificates.asp
- Environmental declarations:
  http://www.tridonic.com/com/en/environmental-declarations.asp
- LED/lamp matrix:
  http://www.tridonic.com/com/en/lamp-matrix.asp
- Operating instructions:
  http://www.tridonic.com/com/en/operating-instructions.asp
- Other technical documents:
  http://www.tridonic.com/com/en/technical-docs.asp
- Tender text:
  http://www.tridonic.com/com/en/tender.asp
- Declarations of conformity: Available documents are found on each product page of our website in the "Certificates" tab for the specific product, www.tridonic.com/com/en/products.asp