

LED-Driver

LCO NF C PRE3

Product Manual



TRIDONIC

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Scope of documentation

1. Validity

These operating instructions are valid for LED Drivers of the LCO NF C PRE3 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.

Copyright

This documentation may not be changed, expanded, copied or passed to third parties without the prior written agreement of TRIDONIC GmbH & Co KG.

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

Imprint

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General safety instructions

2. General safety instructions

The instructions in this section have been compiled to ensure that operators and users of LED Drivers of the LCO NF C PRE3 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.

General safety instructions

CAUTION!

Risk of damage caused by humidity and condensation

- _ 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!

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

3. Description and key features

Description of key features

LCO NF C PRE3 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 LCO NF C PRE3 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 1 %
- _ Diversity of functions:
 - _ NFC, U6Me2, ready2mains, DALI, ETM, AUX 24V, D4i

Main values and functions

Main values and functions

Dimming

Portfolio	Description
Dimmable	✓
Dimming method	Amplitude dimming
Dimming range	100 to 1 %
Dimming curve	Logarithmic dimming curve (standard) Switching to linear dimming curve is possible.
Dimming interfaces	DALI V2-DT6, DSI, ready2mains, chronoSTEP V3

Functions

Portfolio	Description
Intelligent Voltage Guard	✓
Intelligent Temperature Guard	✓
Power-up Fading	✓
DC Operation	DC level adjustable supporting EN 50172
Configuration Interfaces	NFC, DALI V2-DT6, ready2mains, U6Me2
eCLO	✓

Output current

Portfolio	Description
Adjustable output current	✓
Adjustable via...	NFC, DALI V2-DT6, ready2mains
Step size	1 mA
Tolerance	Further information can be found in the data sheet (see Reference list , p. 63).

Technical data

Portfolio	Description
-----------	-------------

Main values and functions

Rated supply voltage	220-240 V
Standby losses	< 0.3 W

Housing variants

Housing variants

LCO NF C PRE3 is available in the following housing variants:

Image	Description
	<p>Housing variant compact</p> <ul style="list-style-type: none">_ Compact shape for installation inside the luminaire casing (in-built)_ Typical area of application: Road, street, industry
	<p>Housing variant compact potted</p> <ul style="list-style-type: none">_ Compact shape for installation inside the luminaire casing (in-built)_ Typical area of application: Road, street, industry

Adjustable output current

Adjustable output current

The output current can be adjusted via NFC, DALI V2-DT6, ready2mains

Adjusting the output current via DALI or ready2mains

Further information about DALI (see [DALI](#), p. 45) or ready2mains (see [ready2mains](#), p. 47) can be found in the corresponding function description of the DALI manual (see [Reference list](#), p. 63).

Adjusting the output current via NFC

The NFC Interface allows wireless communication with the LED Driver. This interface offers the option to write configuration and to read configuration, errors and events with the companionSUITE.

A correct communication between the LED Driver and the NFC antenna can only be guaranteed if the Driver is directly placed on the antenna.

Any material placed between the LED Driver and the NFC antenna can cause a deterioration of the communication quality. We recommend the use of following NFC antennas: www.tridonic.com/nfc-readers

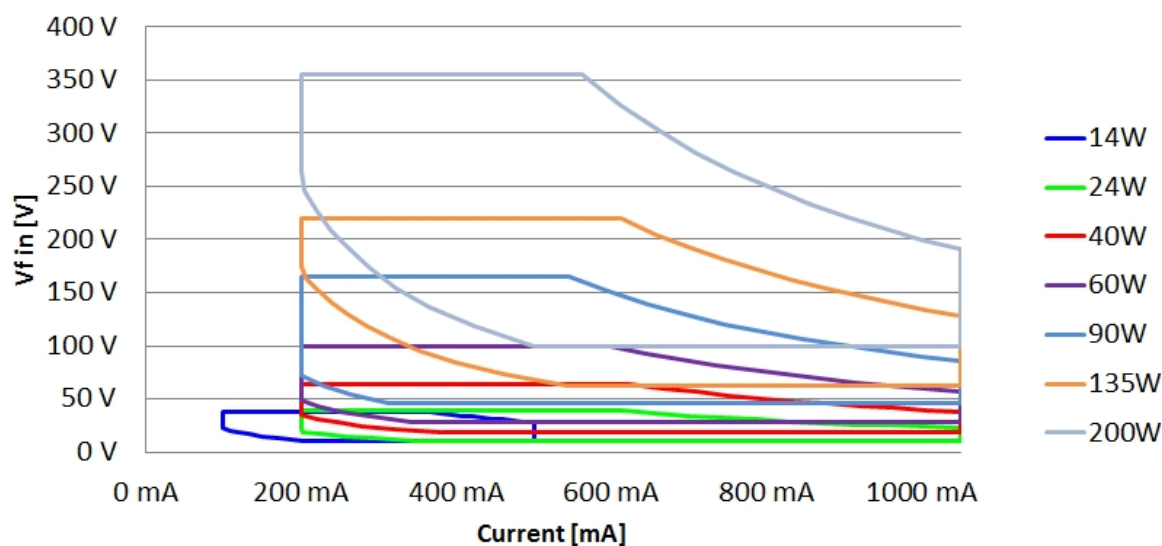
NFC is compliant with ISO/IEC 15963 standard.

Output voltage

The output voltage range results from the selected current. More information can be found in the data sheet (see [Reference list](#), p. 63).

The output current can be adjusted via NFC, DALI or ready2mains. 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. 63).



Compatibility between LED module and LED driver

4. 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	$I_{rated} @HO$	$\geq$	Output current	<ul style="list-style-type: none">_ 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) <div><div> CAUTION!</div><div>The I_{max} can be temperature dependent! Refer to the derating curve of the LED module data sheet.</div></div>
	I_{max}	$\geq$	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	$\geq$	Min. output voltage	_ Check whether voltage range of LED module is completely within the voltage range of LED driver <div>  CAUTION! The forward voltage is temperature dependent! Refer to the V_f/t_p diagram in the data sheet. </div>
	Max. forward voltage	$\leq$	Max. output voltage	
	Min. forward voltage @ min. dim level	$\geq$	Min. output voltage	Only relevant for dimmable LED driver ! <div>  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 LED driver. </div> _ 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 LED driver
(3) LF current ripple	Max. permissible LF current ripple	$\geq$	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

Compatibility between LED module and LED driver

	Max. power consumption	<	Max. output power	
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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	980 mA
Output power	75.0 W

⁽¹⁾ Values at 700 mA

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	1,400 mA
Typ. forward voltage	33 V ±10 % ⁽¹⁾
Min. forward voltage	43.6 V ⁽¹⁾

Compatibility between LED module and LED driver

Max. forward voltage	49.8 V ⁽¹⁾
Max. permissible LF current ripple	1,800 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	✓	<ul style="list-style-type: none"> _ 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.
	1,400 mA	≥	721 mA	✓	<ul style="list-style-type: none"> _ The output current of the LED Driver including tolerances ($700 \text{ mA} + 3 \% = 721 \text{ mA}$) is less than or equal to the max. DC forward current of the LED module (1400 mA).
(2) Voltage	87.2 V	>	45 V	✓	<ul style="list-style-type: none"> _ The voltage range of the LED module ($2 \times 43.6 \text{ V} = 87.2 \text{ V}$; $2 \times 49.8 \text{ V} = 99.6 \text{ V}$) lies completely within the voltage range of the LED Driver (45 - 107 V).
	99.6 V	<	107 V	✓	
(3) LF current ripple	1,800 mA	>	735 mA	✓	<ul style="list-style-type: none"> _ The Output LF current ripple (5 % of output current plus tolerances: $[700 \text{ mA} + 5 \%] \times 1.05 = 735 \text{ mA}$) of the LED Driver is less than the max. permissible LF current ripple of the LED module (1800 mA).
(4) Max. peak current	2,000 mA	>	980 mA	✓	<ul style="list-style-type: none"> _ The max. output current peak of the LED Driver ($700 \text{ mA} + 20 \% = 980 \text{ mA}$) 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	✓	<ul style="list-style-type: none"> _ The power draw of the LED module (64.8 W) is less than the output power of the LED Driver (75.0 W).

Compatibility between LED module and LED driver

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	980 mA
Output power	75.0 W

⁽¹⁾ Values at 700 mA

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

Compatibility between LED module and LED driver

⁽¹⁾ Values at 700 mA

Questions

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

Procedure

Comparison of data sheet values

Comparison of...	Value in LED module		Value in LED Driver	Result	Explanation
(1) Current	700 mA	=	700 mA	✓	<ul style="list-style-type: none"> _ 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	✓	<ul style="list-style-type: none"> _ The output current of the LED Driver including tolerances ($700 \text{ mA} + 5 \% = 721 \text{ mA}$) 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	✗	<ul style="list-style-type: none"> _ 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	>	735 mA	✗	<ul style="list-style-type: none"> _ The Output LF current ripple (2 % of output current plus tolerances: $[700 \text{ mA} + 5 \%] \times 1.02 = 735 \text{ mA}$) 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	✓	<ul style="list-style-type: none"> _ The max. output current peak of the LED Driver ($700 \text{ mA} + 20 \% = 980 \text{ mA}$) is less than the max. permissible peak current with which the LED module can be operated (1,500 mA).

Compatibility between LED module and LED driver

(5) Power	19.75 W	<	75 W		<p>— The power draw of the LED module (19.75 W) is less than the output power of the LED Driver (75.0 W).</p>
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Result

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

Installation notes

5. 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 Drivers of the LCO NF C PRE3 series 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.

i 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

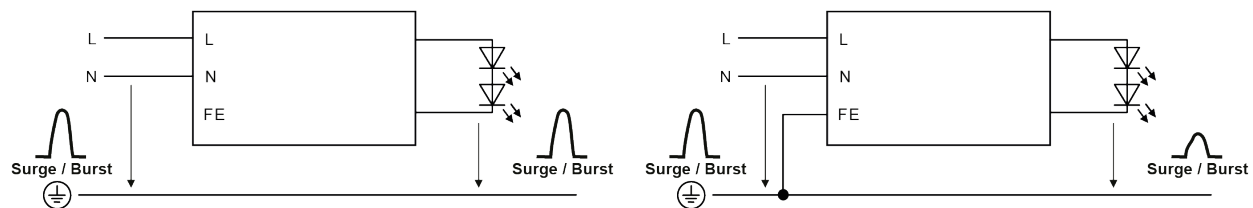
The transfer of mains transients to the LED output presents a problem for many LED Driver topologies currently on the market, and TRIDONIC devices may be affected.

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 megaohm.

As an alternative to measuring the insulation resistance, IEC 60598-1 Annex Q describes a dielectric strength test at 1500 V AC (or $1.414 \times 1,500$ 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 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 LCO 60 /200-1050/100 o4a NF C EXC3 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
LCO 60/200-1050/100 o4a NF C EXC3	16	21	26	33	10	13	16	20	28.4 A	270 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).

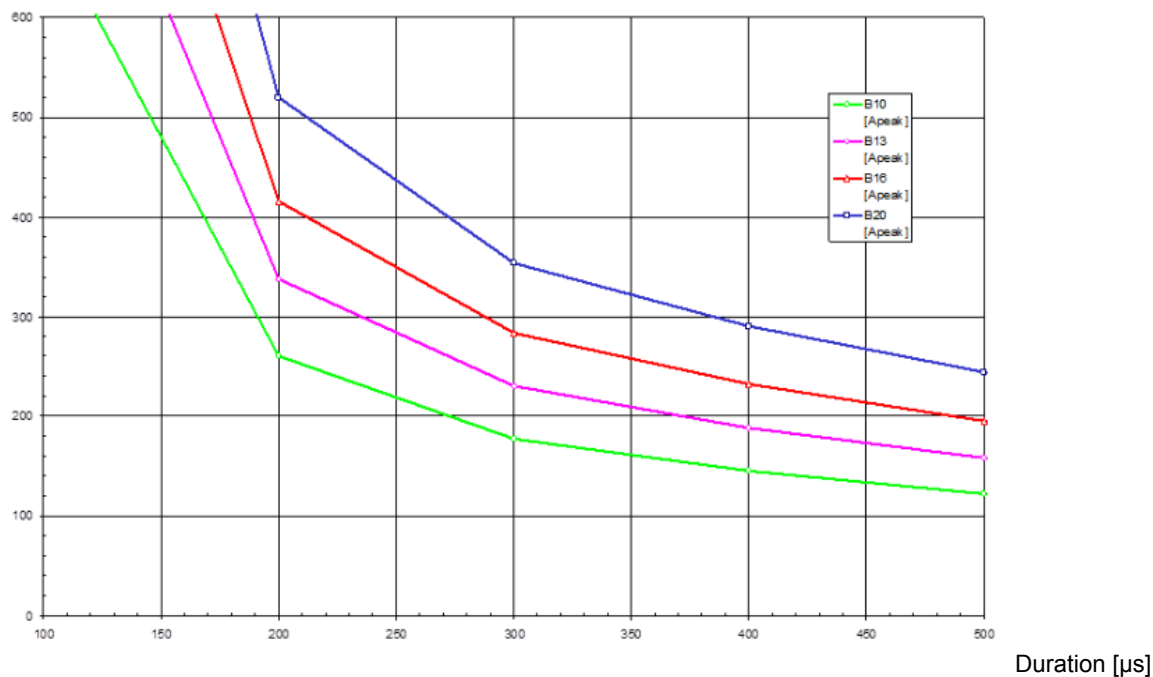
Duration [µs]	Current B10 [A _{peak}]	Current B13 [A _{peak}]	Current B16 [A _{peak}]	Current B20 [A _{peak}]
100	700	910	1,120	1,400
200	260	338	416	520
300	177	230.1	283	354
400	145	188.5	232	290
500	122	158.6	195	244
600	110	143	176	220
700	102	132.6	163	204
800	97	126.1	155	194
900	93	120.9	149	186
1,000	90	117	144	180

Installation notes

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

Installation notes

Current [A]



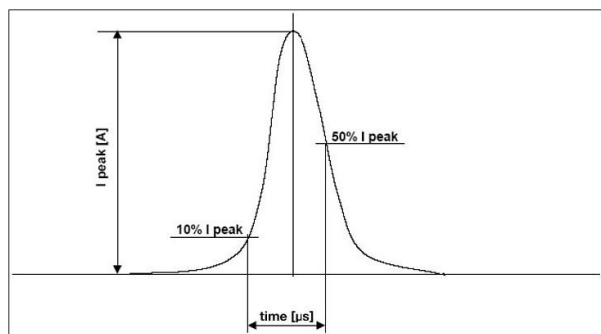
NOTICE

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

Calculation of the inrush current

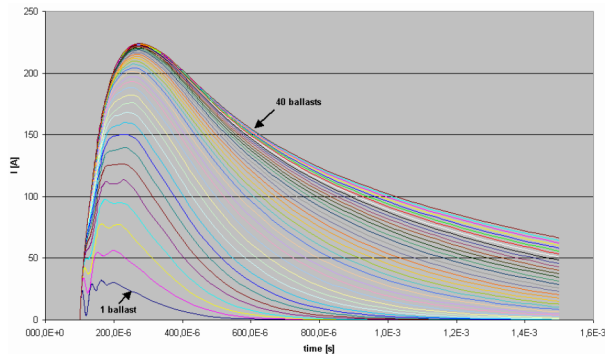
The inrush current of a control gear is also defined by its duration and its height. The duration is typically measured as the time between 10 % of maximum current (ascending) and 50 % of maximum current (descending).

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



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

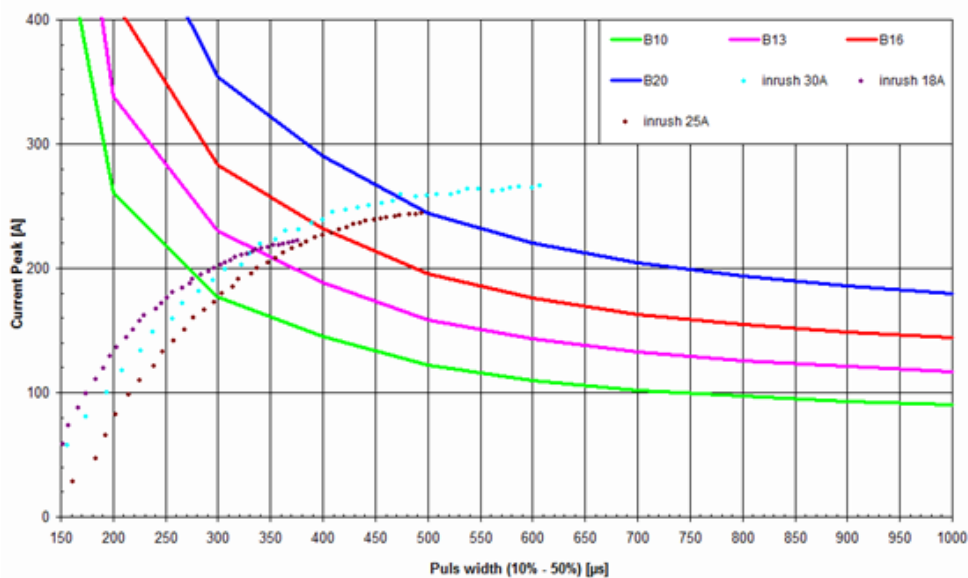
Installation notes



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:

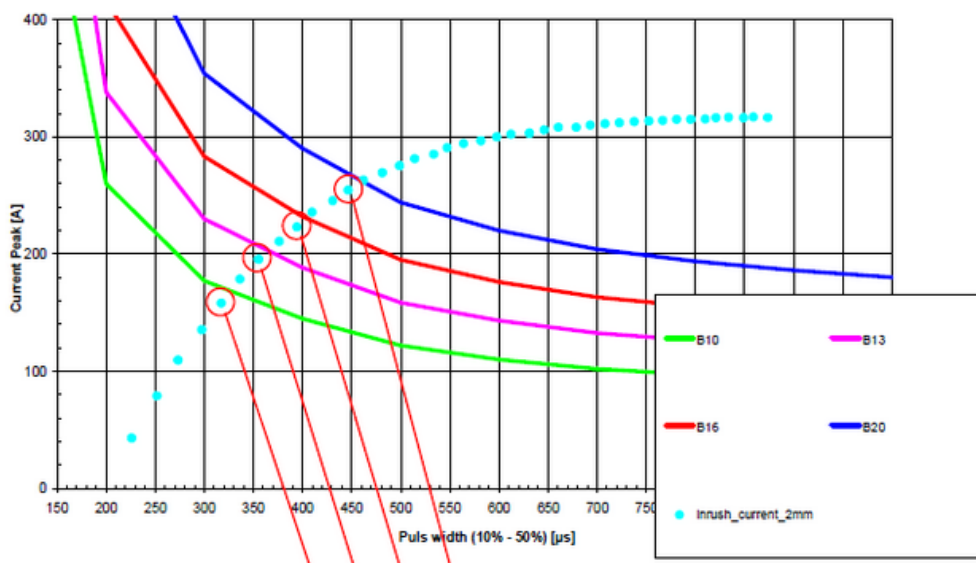
- The crossing of the two lines shows the maximum value for the selected combination of circuit breaker and inrush current.

Installation notes

- _ The index of the point at this maximum value shows the max. number of control gear.

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 ohm * mm² / m; inductance: 5 nH / cm; terminal resistance: 2 milliohm)
- _ 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 and interfaces

6. Functions and interfaces

IVG Plus

Description

In some cases mains voltage is not stabilized and has some voltage peaks which are lower or higher than the nominal voltage range.

Between 192 V and 80 V input voltage, the LED Driver operates in undervoltage mode and dims the secondary side linearly down to 10 %.

Below 80 V input voltage, the LED Driver shuts down, restarts at 90 V (without a reset) and dims linearly up back to 100 %.

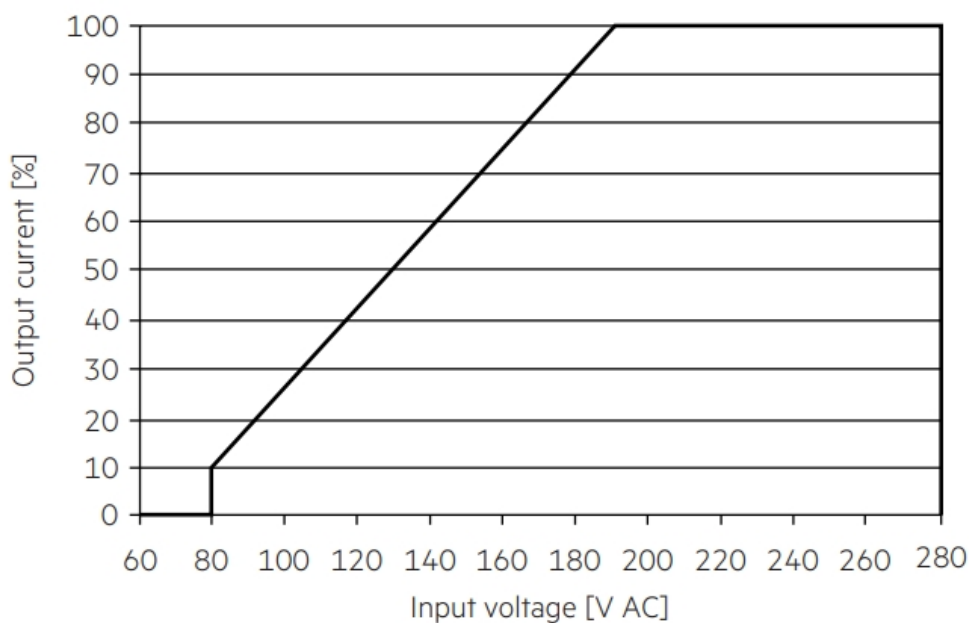
Above 280 V input voltage, the LED Driver shuts down. If input voltage drops below 270 V, the LED Driver restarts (without a reset).

⚠ WARNING!

If the driver is operated on voltages higher >280V it will turn off automatically. This is a safety feature only on streetlight applications.

i NOTICE

If overvoltage is detected, the connected sensors are ignored.



IVG Plus

Commissioning

Activating the IVG Plus function

The IVG Plus function is activated by default.

Deactivating the IVG Plus function

Deactivating the IVG Plus function via masterCONFIGURATOR

The eCLO function can be deactivated via the masterCONFIGURATOR.

Further information can be found in the masterCONFIGURATOR manual (see http://www.tridonic.com/com/en/download/Manual_masterConfigurator_en.pdf).

eCLO

eCLO

Description

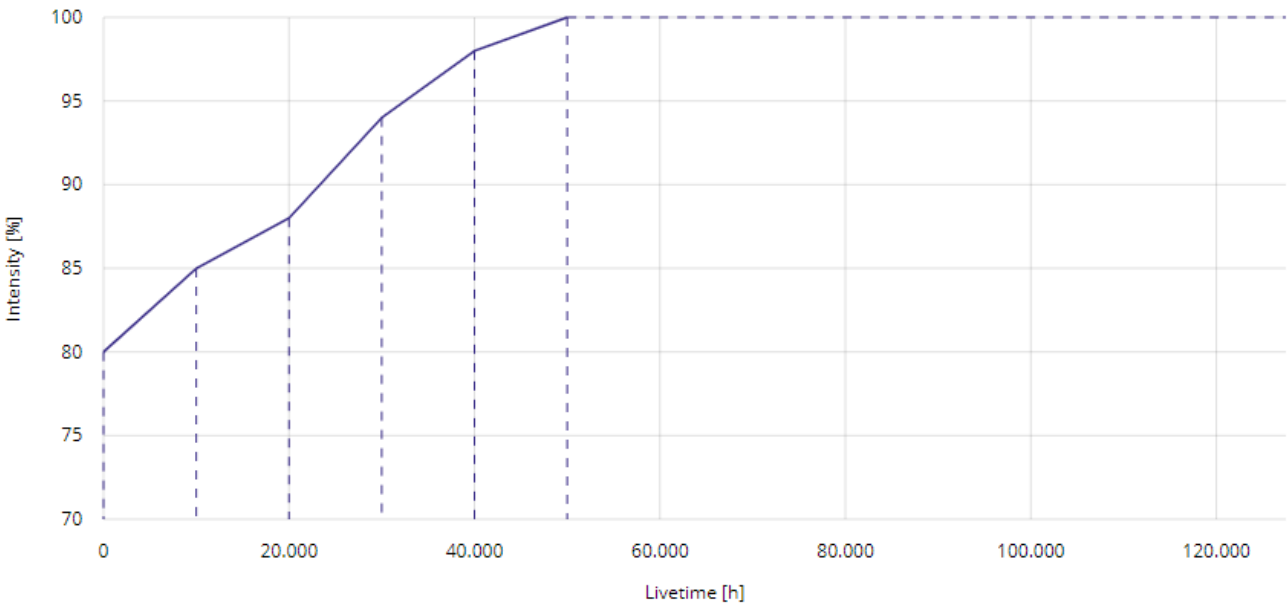
The light output of an LED module reduces over the course of its lifetime.
The eCLO function (enhanced Constant Light Output) compensates for this natural decline by constantly increasing the output current of the LED Driver throughout its lifetime.

As a results, a virtually uniform light output is achieved at all times.

Up to 8 steps, each with a timer value and an intensity value, can be used for the configuration.

Starting from these steps, the control of the output current takes place automatically. If the function "visual feedback" is enabled, visual feedback is given as soon as the LED exceeds the expected LED lifetime, see table "Parameter".

	Initial	Step 1	Step 2	Step 3	Step 4	Step 5	Step 6	Step 7
Timer value [h]	<input type="text" value="0"/>	<input type="text" value="10000"/>	<input type="text" value="20000"/>	<input type="text" value="30000"/>	<input type="text" value="40000"/>	<input type="text" value="50000"/>	<input type="text" value="0"/>	<input type="text" value="0"/>
Intensity [%]	<input type="text" value="-"/> <input type="text" value="80"/> <input type="text" value="+"/>	<input type="text" value="-"/> <input type="text" value="85"/> <input type="text" value="+"/>	<input type="text" value="-"/> <input type="text" value="88"/> <input type="text" value="+"/>	<input type="text" value="-"/> <input type="text" value="94"/> <input type="text" value="+"/>	<input type="text" value="-"/> <input type="text" value="98"/> <input type="text" value="+"/>	<input type="text" value="-"/> <input type="text" value="100"/> <input type="text" value="+"/>	<input type="text" value="-"/> <input type="text" value="100"/> <input type="text" value="+"/>	<input type="text" value="-"/> <input type="text" value="100"/> <input type="text" value="+"/>
LED burning hours [h]	<input type="text" value="-"/> <input type="text" value="50000"/> <input type="text" value="+"/>	☐ Visual feedback						



Parameter

Parameter	Default value	Description	Min value	Max value
Initial timer value	0 h	The initial timer value is always 0. The function will be started from this step.	0 h	0 h
Initial intensity	100 %	Specifies the intensity, with which the function is started.	70 %	100 %
Step 1 - 7 timer value	0 h	For each of the 7 further steps (1 - 7) a separate timer value can be specified. After the period specified here, the respective intensity of the level (1 - 7) is taken. The 7 timer values are to be entered as absolute values.	0 h	127,500 h
Step 1 - 7 intensity	100 %	For each of the 7 further steps (1 - 7) an intensity can be specified. If one of the levels is defined as 100 %, the function is ended at this step.	70 %	100 %
LED burning hours	0 h	Makes it possible to adjust the burning hours of an LED. With this, LEDs with different burning hours can be matched to each other when LEDs are replaced.	0 h	131,070 h
Visual feedback	Off	If visual feedback 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.	Off	On

Commissioning**Activating and adjusting the eCLO function**

Activating and adjusting the eCLO function via companionSUITE (valid for EXC3 and ADV3)

The eCLO function can be activated and adjusted via companionSUITE.

Further information can be found on the Tridonic homepage at http://www.tridonic.com/download/help/Overview_en.html and http://www.tridonic.com/download/help/Enhanced_constant_light_output_eCLO_en.html.

Activating and adjusting the eCLO function via masterCONFIGURATOR (valid only for EXC3)

The eCLO function can be activated and adjusted via the masterCONFIGURATOR.

Further information can be found in the masterCONFIGURATOR manual (see http://www.tridonic.com/com/en/download/Manual_masterConfigurator_en.pdf).

ETM

External temperature management

Description

ETM protects the LED module against thermal overstress.

An external temperature sensor (NTC) detects the LED module temperature and the LED Driver will limit the output current according to this temperature:

If the temperature is between the limits T1 (normal condition) and T2 (overload), the LED output current will be decreased.

If the temperature exceeds the limit T3 (critical temperature), the device will switch to the shutdown level.

The shutdown level will be active until the module temperature decreases below T1 or until the LED Driver is restarted (switch off or mains reset).

NOTICE

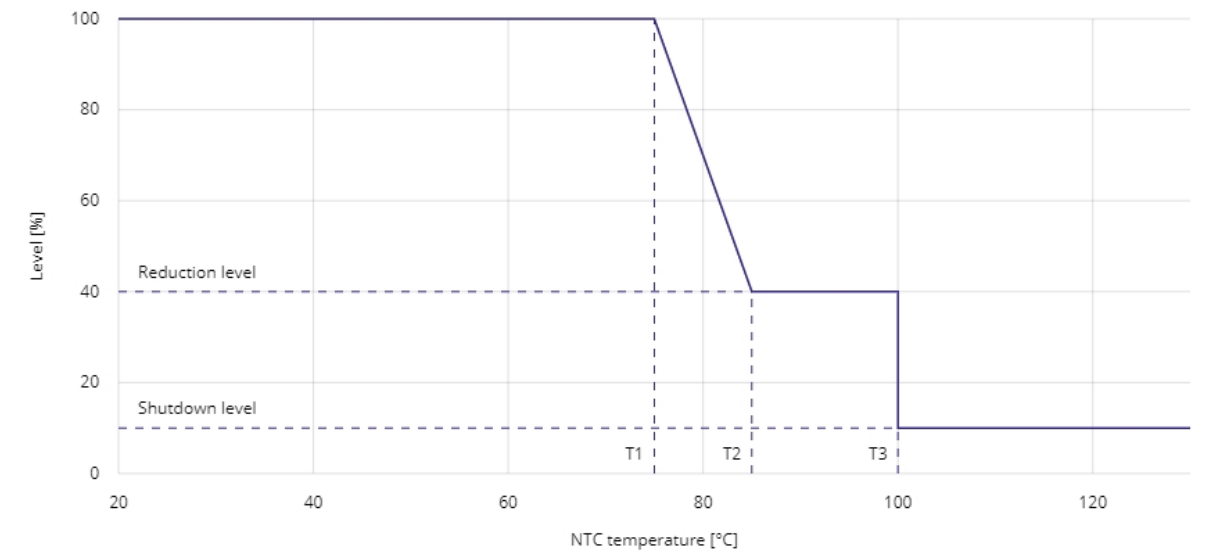
The LED module's temperature is only measured if the output is active (lamp is on).

The allowed NTC resistor value is between 0 to 2 megaohm. By default there are three predefined values that can be set via programming software, up to five individual values can be added.

The temperature sensor (NTC) is defined by two parameters, the resistance value at 25 °C (R25) and the sensor constant (BETA).

ETM

External temperature managment [ON / OFF]	<div>ON</div> <div>OFF</div>	Lower temperature limit T1 [50-105°C]	<div>-</div> <div>75</div> <div>+</div>
Reduction level [10-100%]	<div>-</div> <div>40</div> <div>+</div>	Upper temperature limit T2 [60-115°C]	<div>-</div> <div>85</div> <div>+</div>
Shutdown level [0; 5-30%]	<div>-</div> <div>10</div> <div>+</div>	Critical temperature T3 [70-125°C]	<div>-</div> <div>100</div> <div>+</div>
Select NTC sensor	<div>NCP 18XW223</div>	Sensor constant (BETA) [0-4890K]	<div>-</div> <div>3987</div> <div>+</div>
		Resistance at 25°C (R25) [0-470000Ω]	<div>-</div> <div>22000</div> <div>+</div>



ETM

Parameter

Parameter	Default value	Description	Min value	Max value
External temperature management	OFF	Via this checkbox the function can be activated or deactivated	OFF	ON
Lower temperature limit T1	75 °C	Temperature at which the power reduction starts	50 °C	T2 - 10 °C
Upper temperature limit T2	85 °C	Temperature where the power reduction stops at the reduction level	T1 + 10 °C	T3 - 10 °C
Critical temperature T3	100 °C	Critical temperature at which the device switches to the shutdown level	T2 + 10 °C	Device dependent (maximum 127 °C)
Reduction level	40 %	Level up to which the power is reduced	10 %	100 %
Shutdown level	10 %	Level to be switched to, when reaching the critical temperature T3	Physical minimum	Reduction level (maximum 30 %)
Select NTC sensor	–	Here, predefined NTC types can be selected or user defined values can be entered. The sensor constant (BETA) and the resistance at 25 °C (R25) can be precisely defined.	–	NCP 18XH103J NCP 18XW153J NCP 18XW223J User defined
Sensor constant (BETA)	0 K	This constant is needed to convert the resistance value to a temperature in an NTC resistor, displayed in Kelvin.	0 K	4,890 K
Resistance at 25 °C (R25)	0 ohm	Resistance value of the NTC sensor at 25 °C	0 ohm	470,000 ohm

Commissioning

Activating and adjusting the ETM function

Activating and adjusting the ETM function via companionSUITE

The ETM function can be activated and adjusted via companionSUITE.

Further information can be found on the Tridonic homepage at http://www.tridonic.com/download/help/Overview_en.html and http://www.tridonic.com/download/help/ETM_en.html.

Activating and adjusting the ETM function via masterCONFIGURATOR

The ETM function can be activated and adjusted via the masterCONFIGURATOR.

Further information can be found in the masterCONFIGURATOR manual (see http://www.tridonic.com/com/en/download/Manual_masterConfigurator_en.pdf).

chronoSTEP V3

chronoSTEP V3

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 v3 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.

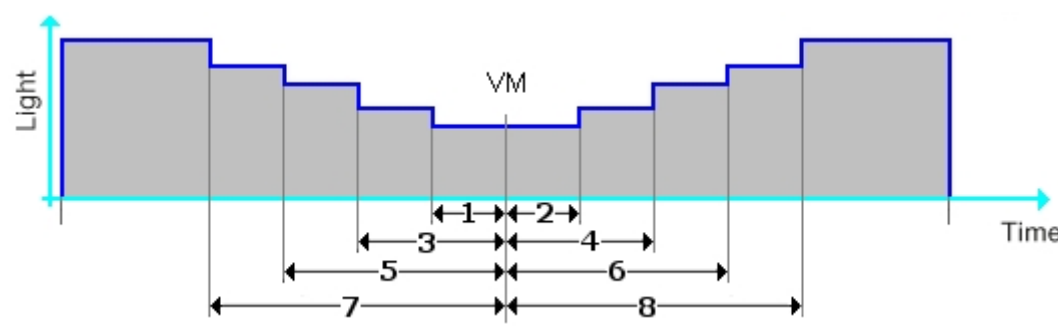
In chronoSTEP V3 there is a total of two profiles:

- _ Factory default: chronoSTEP deactivated (light output set to 100 %)
- _ Profile 1: user-defined programmable profile

Profiles are defined by different pairs of reduction times and reduction levels. A maximum of eight such reduction time/level pairs are available. Creating profiles with less than eight such pairs is also possible.

The basic set up of a profile looks like this:

Profiles:



chronoSTEP V3

Commissioning

Activating and adjusting the chronoSTEP function

Activating and adjusting the chronoSTEP function via companionSUITE

The chronoSTEP function can be activated and adjusted via companionSUITE.

Further information can be found on the Tridonic homepage at http://www.tridonic.com/download/help/Overview_en.html and http://www.tridonic.com/download/help/chronoSTEP_en.html.

Activating and adjusting the chronoSTEP function via masterCONFIGURATOR

The chronoSTEP function can be activated and adjusted via the masterCONFIGURATOR.

Further information can be found in the masterCONFIGURATOR manual (see http://www.tridonic.com/com/en/download/Manual_masterConfigurator_en.pdf).

Activating and adjusting the chronoSTEP function via U6Me2

The chronoSTEP function can also be activated and adjusted via U6Me2.

A detailed U6Me2 programming instruction is available on request. Contact Tridonic technical support!

U6Me2

U6Me2

Description

U6Me2 is the communication type to activate and adapt the chronoSTEP function in the device using switch-on and switch-off commands.

A detailed U6Me2 programming instruction is available on request. Contact Tridonic technical support!

DSI

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

Further information can be found in the DALI Handbook (see http://www.tridonic.com/com/en/download/technical/DALI-manual_en.pdf).

Activating and adjusting the DSI function via masterCONFIGURATOR

The DSI function can be activated and adjusted via the masterCONFIGURATOR.

Further information can be found in the masterCONFIGURATOR manual (see http://www.tridonic.com/com/en/download/Manual_masterConfigurator_en.pdf).

Power-up fading

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

Activating and adjusting Power-up Fading via masterCONFIGURATOR

The Power-up Fading function can be activated and adjusted via the masterCONFIGURATOR.

Further information can be found in the masterCONFIGURATOR manual (see http://www.tridonic.com/com/en/download/Manual_masterConfigurator_en.pdf).

DALI

DALI

Description

DALI standard

NOTICE

LCO NF C PRE3 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

DALI

- _ Data transfer rate: 1200 Baud
- _ Maximum line length: up to 300 m (for 1,5 mm²)

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 http://www.tridonic.com/com/en/download/technical/DALI-manual_en.pdf).

Activating and adjusting the DSI function via masterCONFIGURATOR

DALI can be activated and adjusted via the masterCONFIGURATOR.

Further information can be found in the masterCONFIGURATOR manual (see http://www.tridonic.com/com/en/download/Manual_masterConfigurator_en.pdf).

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.

ready2mains

ready2mains

Description

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

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.

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. 63).

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

DC recognition

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 LCO NF C PRE3 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. 63).

NOTICE

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

Dimming on DC

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

Activating and adjusting Dimming on DC via masterCONFIGURATOR

Dimming on DC can be activated and adjusted via the masterCONFIGURATOR.

Further information can be found in the masterCONFIGURATOR manual (see http://www.tridonic.com/com/en/download/Manual_masterConfigurator_en.pdf).

Activating and adjusting Dimming on DC via companionSUITE

Dimming on DC can be activated and adjusted via companionSUITE.

Further information can be found on the Tridonic homepage at http://www.tridonic.com/download/help/Overview_en.html and http://www.tridonic.com/download/help/DC_level_en.html.

Intelligent Temperature Guard

Intelligent Temperature Guard

 WARNING!

The t_c temperature is the maximum permitted temperature 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.

The output is reduced in small stages that are generally imperceptible to the user:

- _ The temperature is checked every two minutes
- _ If the temperature is too high, the output is reduced by about 2 %
- _ This process is repeated until the LED Driver returns to its permitted temperature range
- _ The maximum output reduction is 50 %

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

Parameters	Description
------------	-------------

Intelligent Temperature Guard

Starting point of power reduction	<p>When maximum t_c temperature is exceeded. ⁽¹⁾</p> <div> <p>i NOTICE</p> <p>The temperature at which the power reduction starts is device-specific and depends on the load and the installation situation.</p> <p>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.</p> <p>In any case, the starting point of the power reduction is higher than the predetermined maximum t_c temperature.</p> <p>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.</p> </div>
Type of power reduction	Power reduction takes place in gradual steps.
Power reduction process and control	<p>Power reduction is dependent on temperature:</p> <ul style="list-style-type: none"> _ 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: <ul style="list-style-type: none"> _ Drivers go to 15 % dim level
Min power level	ca. 50 % dim level ⁽²⁾
Shut off behaviour	<p>No shut off behaviour:</p> <p>Device will not shut off if temperature still rises.</p> <ul style="list-style-type: none"> _ AC mode: Device switches to 15 % dimming level _ DC mode: Intelligent Temperature Guard is not relevant because driver goes to EOFx level anyway
Automatic restart behaviour	No automatic restart behaviour (because there is no shut off behaviour)

Intelligent Temperature Guard

Restart temperature	No restart temperature
---------------------	------------------------

- (1) Rated t_c is device specific.
- (2) Flicker will be visible because of PWM frequency.

 NOTICE

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

Commissioning

Activating and adjusting ITG via the masterCONFIGURATOR

The ITG function can also be activated and adjusted via the masterCONFIGURATOR.
Further information can be found in the masterCONFIGURATOR manual (see http://www.tridonic.com/com/en/download/Manual_masterConfigurator_en.pdf).

Activating and adjusting the ITG via companionSUITE

The ITG function can also be activated and adjusted via companionSUITE.
Further information can be found on the Tridonic homepage at http://www.tridonic.com/download/help/Overview_en.html and http://www.tridonic.com/download/help/corridorFUNCTION_en.html.

Surge Burst protection

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 LCO NF C PRE3 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)

Further information can be found in the data sheet (see [Reference list](#), p. 63).

DiiA Specification

DiiA Specification

Description

DALI Part 150 – AUX Power Supply

An AUX supply as specified in this standard provides 24 V DC to power e.g. a controller, an occupancy sensor, a photo sensor or other device. An AUX supply can eliminate the need for an AC/DC supply and the associated need for surge suppression and an EMI filter in such applications.

DALI Part 250 – Integrated Bus Power Supply (Device Type 49)

This standard specifies the characteristics of a DALI bus power supply integrated in a control gear. This standard builds on the Digital Addressable Lighting Interface as specified in the IEC62386 series of standards, by adding specific requirements to enable powering of an external device and addressing data exchange.

DALI Part 251 – Memory Bank 1 Extension (Device Type 50)

This standard specifies an extension to memory bank 1 to enable asset management functionality. This standard builds on the Digital Addressable Lighting Interface as specified in the IEC62386 series of standards.

DALI Part 252 – Energy Reporting (Device Type 51)

This standard specifies the information related to energy reporting accessible through memory banks in control gear. This standard builds on the Digital Addressable Lighting Interface as specified in the IEC62386 series of standards, by adding specific requirements to address data exchange.

DALI Part 253 – Diagnostics & Maintenance (Device Type 52)

This standard specifies the information related to diagnostics and maintenance information accessible through memory banks. This standard builds on the Digital Addressable Lighting Interface as specified in the IEC62386 series of standards, by adding specific requirements to address data exchange. The information given for light source in this standard is LED light source specific.

Commissioning

DALI Part 150 – Specification for AUX Power Supply

- _ Average power of 3 W.
- _ Average output voltage of 24 V +/-10 %
- _ Maximum voltage does not exceed 30 V under any load condition including open circuit
- _ Start-up time: 90% of the nominal specified voltage level within 600 ms after applying mains power.
- _ Start-up: After power-on, the load must limit the current consumption at the AUX terminals to at most 160 mA until the specified voltage is reached.

DALI Part 250 – Specification for Integrated Bus Power Supply (Device Type 49)

- _ The output power of the integrated DALI Bus Power Supply (pDALI) has an output current of 50 mA. It is activated by factory default for outdoor devices.

DiiA Specification

- _ Sensors and also external drivers could be directly connected to this power supply.
- _ The DALI power supply could be deactivated via software.
- _ Several power supply must not be combined.
- _ If the DALI power supply is activated, the driver must not be integrated into an existing, already powered, DALI network.

DALI Part 251 – Specification for Memory Bank 1 Extension (Device Type 50)

This function provides an extension to memory bank 1 to enable asset management functionality. Several internal values from the driver could be read out from this memory bank. For example luminaire year, week and description. Also power levels, AC mains voltages and light output can be read out.

DALI Part 252 – Specification for Energy Reporting (Device Type 51)

This function provides the information related to energy reporting accessible through memory banks in this driver. Several functions and values could be read out to gain access in Content management systems. Report and values for Active power, Active Energy and many more can be read out.

DALI Part 253 – Specification for Diagnostics & Maintenance (Device Type 52)

This function provides the information related to diagnostics and maintenance information accessible through memory banks. Several functions and values could be read out to gain access in Content management systems. Report and values for failure behaviour, driver conditions and malfunctions trigger points can be read out.

NFC

NFC

Description

The NFC Interface allows wireless communication with the LED Driver.

This interface offers the option to write configuration and to read configuration, errors and events with the companionSUITE.

A correct communication between the LED Driver and the NFC antenna can only be guaranteed if the antenna is placed directly on the Driver.

Any material placed between the LED Driver and the NFC antenna can cause a deterioration of the communication quality.

After programming the device via NFC power up the device one time for one second till the deviceANALYSER can read out the parameters.

We recommend the use of following NFC antenna: www.tridonic.com/nfc-readers

NFC is complied with ISO/IEC 15963 standard.

Commissioning

Further information about commissioning can be found at https://www.tridonic.com/com/en/download/technical/NFC_readers_companionSUITE.pdf and https://www.tridonic.com/com/en/download/technical/Technical_Information_NFC_Multiprogramming_en.pdf.

sensorMODE

sensorMODE

Description

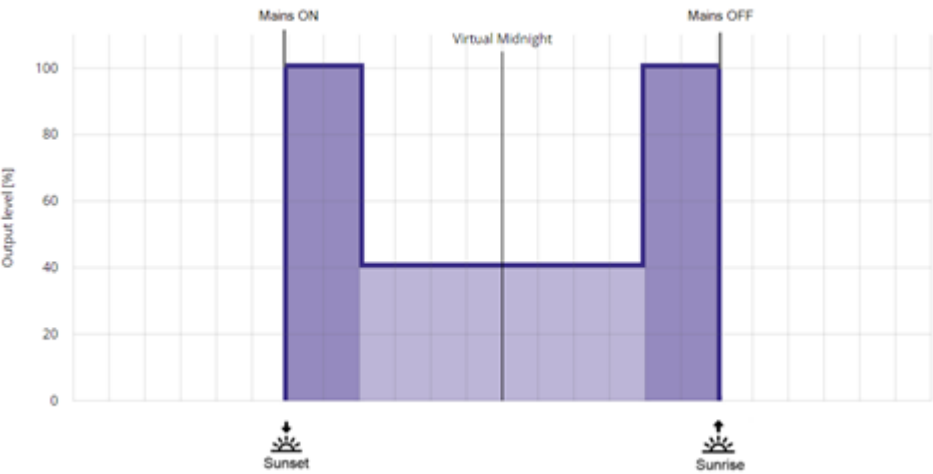
The sensorMODE combines the features chronoSTEP and corridorFUNCTION and adds the possibility to control them with a DALI input device directly connected to the LED driver.

There are 5 different control modes supported by the sensorMODE function.

Mode 0: Disabled

In this mode the LED driver uses the standard chronoSTEP function which is started by switching the mains on/off.

Please find more information here on how to [program the chronoSTEP function](#).



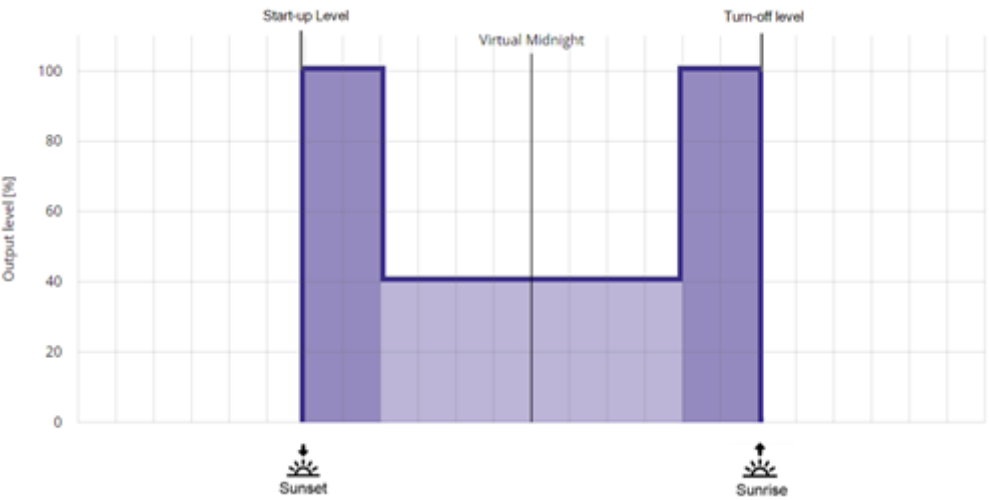
Mode 1: Ambient light control

In this mode the light sensor of a connected DALI sensor is used to start/stop the chronoSTEP function.

The chronoSTEP function is started when the measured light value falls below the defined start-up level and turned off as soon as the measured value exceeds the defined turn-off level.

Parameter	Default value	Description	Min value	Max value
Switch-on level	50 lx	Defines at which light level the chronoSTEP function should be started.	0 lx	1,000 lx
Switch-off level	200 lx	Defines at which level the chronoSTEP function should be stopped.	0 lx	5,000 lx

sensorMODE

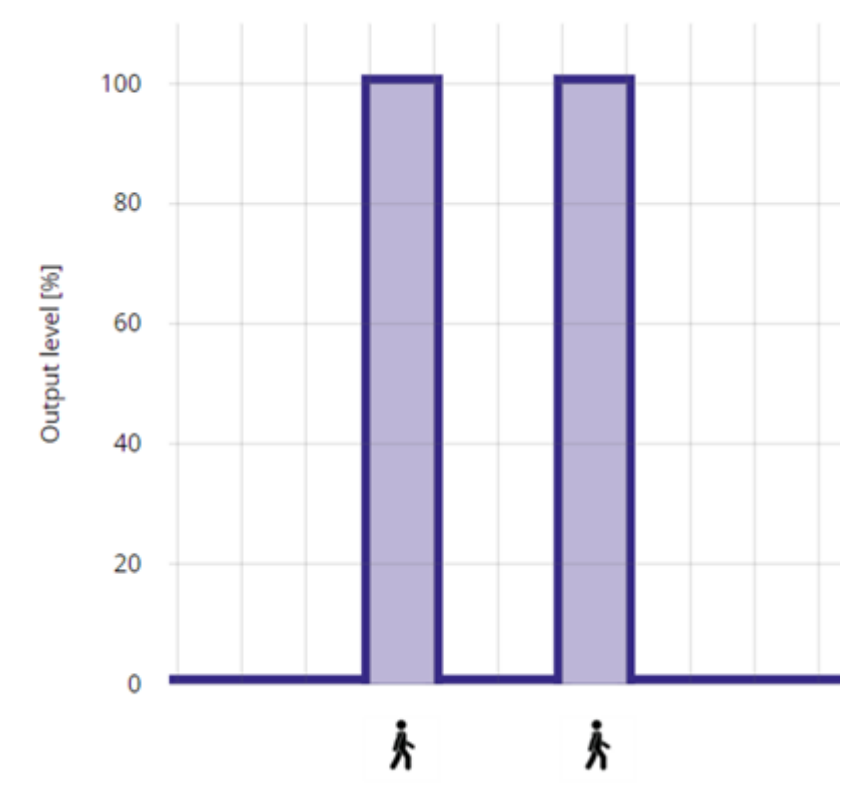


Mode 2: Motion control

This mode triggers the well known corridorFUNCTION by a connected DALI motion sensor instead of a mains switch.

Parameter	Default value	Description	Min value	Max value
Presence level	100 %	Brightness value the luminaire occupies as soon as a movement /presence has been detected.	0 %	100 %
Absence level	10 %	Brightness value that the luminaire occupies while the switch-off delay is running.	0 %	100 %
Fade-in time	0 s	Time required to reach the presence level.	0 s	160 min
Run-on time	0 s	Time that begins to run from the last moment that presence was detected in the room. After the run-on time the fade-out transition is started. If another presence is detected in the room during run-on time, the run-on time is started again.	0 s	42 min 30 s
Fade-out time	30 s	Time needed to reach the absence value.	0 s	160 min
Switch-off delay	Never off	Time in which the absence value is held. After expiration, it is either switched off or the absence value is held (Never off).	0 s	42 min 20 s Never off

sensorMODE



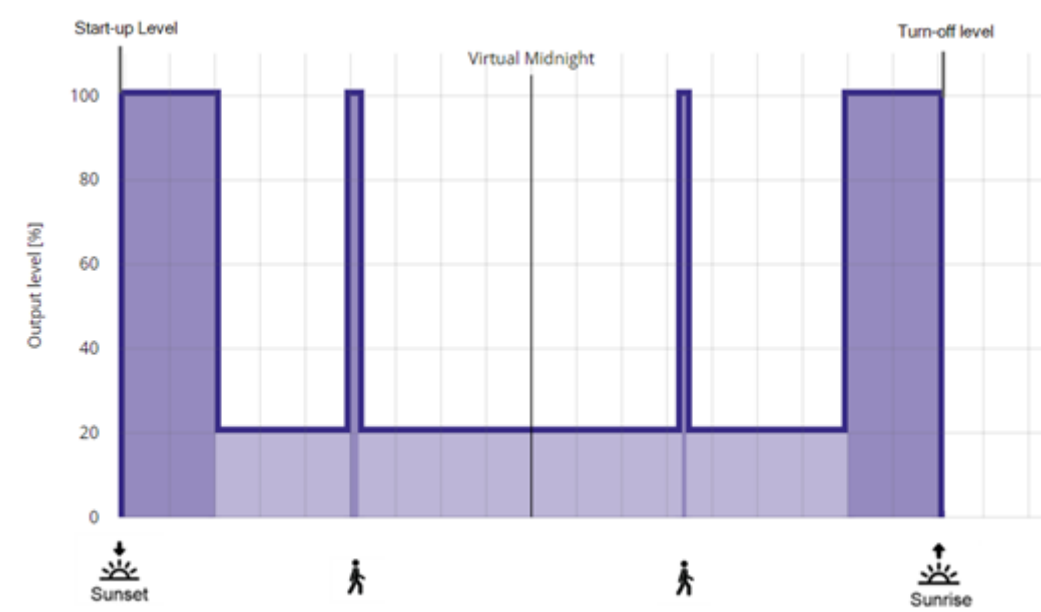
Mode 3: Ambient light with motion control

This mode combines the function ambient light control and motion control.
The chronoSTEP function is activated by the ambient light level but it can be temporarily overwritten by the motion sensor if motion is detected.

Parameter	Default value	Description	Min value	Max value
Switch-on level	50 lx	Defines at which light level the chronoSTEP function should be started.	0 lx	1,000 lx
Switch-off level	200 lx	Defines at which level the chronoSTEP function should be stopped.	0 lx	5,000 lx
Presence level	100 %	Brightness value the luminaire occupies as soon as a movement/presence has been detected.	0 %	100 %
Fade-in time	0 s	Time required to reach the presence value.	0 s	160 min

sensorMODE

Run-on time	0 s	<p>Time that begins to run from the last moment that presence was detected in the room.</p> <p>After the run-on time the transition is started.</p> <p>If another presence is detected in the room during run-on time, the run-on time is started again.</p> <div><p>⚠ CAUTION!</p><p>Please note that the driver has an internal 1 minute time out before the chronoSTEP function takes over again.</p><p>That means if you want to have a run-on time of 5 min you have to program 4 min run-on time (4 min run-on time + 1 min time out).</p></div>	0 s	42 min 30 s
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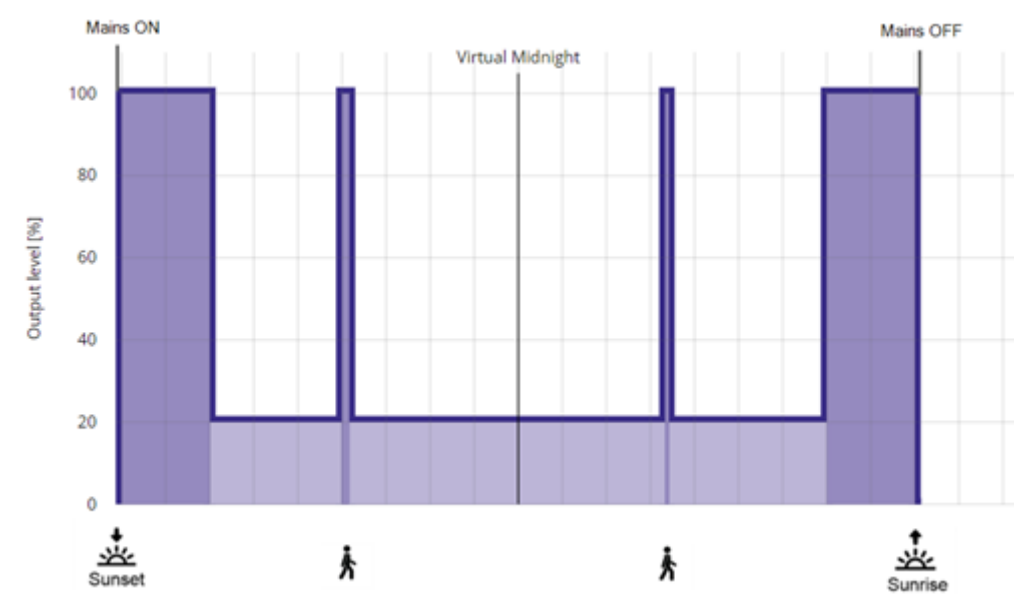
Mode 4: Mains with motion control

In this mode the chronoSTEP function is controlled by switching the mains, but it can be temporarily overwritten by the motion sensor if motion is detected.

Parameter	Default value	Description	Min value	Max value
Presence level	100 %	Brightness value the luminaire occupies as soon as a movement/presence has been detected.	0 %	100 %
Fade-in time	0 s	Time required to reach the presence value.	0 s	160 min

sensorMODE

Run-on time	0 s	<p>Time that begins to run from the last moment that presence was detected in the room.</p> <p>After the run-on time the transition is started.</p> <p>If another presence is detected in the room during run-on time, the run-on time is started again.</p> <div><p>⚠ CAUTION!</p><p>Please note that the driver has an internal 1 minute time out before the chronoSTEP function takes over again.</p><p>That means if you want to have a run-on time of 5 min you have to program 4 min run-on time (4 min run-on time + 1 min time out).</p></div>	0 s	42 min 30 s
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Failure handling

In case the driver does not receive any events from DALI inputs for at least 5 minutes, the DALI system failure level will be set.

In configuration mode 0 (mains only), the gear will not react to DALI input devices and therefore no failure level will be activated, whereas in configuration mode 3 (light and occupancy control) a periodical event is expected from both input devices.

sensorMODE

NOTICE

Possible reasons for missing DALI events from connected sensors:

- _ Invalid configuration of DALI sensor or gear
- _ Defect of a DALI sensor
- _ Problems in wiring
- _ Disabled / no DALI power supply

Reference list

7. Reference list

Additional information

- _ Web page premium D4i NFC outdoor series:
 - [LCO 14 W 100–550 mA pD+ NFC PRE3](#)
 - [LCO 24 W 200–1050 mA pD+ NFC PRE3](#)
 - [LCO 40 W 200–1050 mA pD+ NFC PRE3](#)
 - [LCO 60 W 200–1050 mA pD+ NFC PRE3](#)
 - [LCO 90 W 200–1050 mA pD+ NFC PRE](#)
 - [LCO 135 W 200–1050 mA pD+ NFC PRE3](#)
 - [LCO 200 W 200–1050 mA pD+ NFC PRE3](#)
- _ 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"
- _ Webpage companionSUITE:
 - <https://www.tridonic.com/com/en/products/companionsuite.asp>
- _ 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
- _ Web page corridorFUNCTION:
 - <http://www.corridorfunction.com/corridorFUNCTION/index.html>
- _ NFC readers/writers supported by companionSUITE
 - https://www.tridonic.com/com/en/download/technical/NFC_readers_companionSUITE.pdf
- NFC Multiprogramming
 - https://www.tridonic.com/com/en/download/technical/Technical_Information_NFC_Multiprogramming_en.pdf

Downloads

- _ Tridonic software:
 - <http://www.tridonic.com/com/en/software.asp>

Reference list

- _ Download masterCONFIGURATOR:
<http://www.tridonic.com/com/de/software-masterconfigurator.asp>

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