TRIDONIC

TALEXengine STARK DLE PREMIUM system data sheet
STARK DLE

Product description

- Tunable White system with adjustable colour temperature along the planck's curve from 2.700 to 6.500 K
- New DALI device Type 8 for Tunable White
- Noise-free precise control via switchDIM, DALI or DSI
  Necessary system components:
- TALEXmodule STARK DLE PREMIUM
- TALEXconverter LCAU 2x20 W one4all
- 5-year guarantee

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TALEXengine STARK DLE PREMIUM system

TALEXmodule STARK DLE PREMIUM

TALEXconverter LCAU 2x20 W one4all

Ordering data

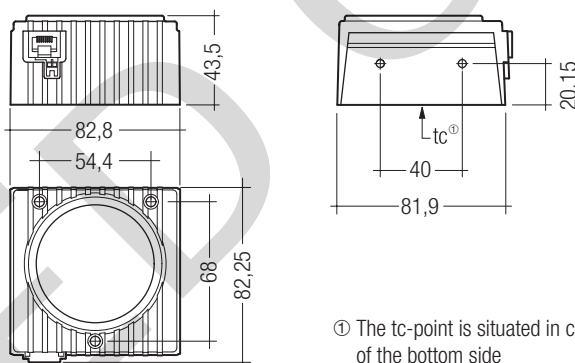| Type	Article number	System components
STARK DLE 800-927-965-PRE	89601166	Module with integrated controls
STARK DLE 1800-927-965-PRE	89601165	Module with integrated controls
LCAU 2x020/0048 L010 one4all	86459414	In-built LED control gear
LCAU 2x020/0048 L020 one4all	86459108	Remote LED control gear

◇ ♨ ☣ CE [RoHS]

Product description

- Tunable White module with adjustable colour temperature along the planck's curve[5]
- High efficiency
- High colour rendering index CRI > 90
- Low tolerances for colour temperature (MacAdams 3)
- Low light current tolerances
- High-power LED module in chip-on-board technology (COB)
- Excellent thermal management[3]
- Downlights
- Constant colour over the dimming range from 15 to 100 %

Technical data

Beam characteristic	80°
Ambient temperature ta[3]	-25 ... +55 °C
tc point	65 °C
Risk group (EN 62471:2008)	1

→

Standards, page 5

Colour temperatures and tolerances, page 7

Product description, page 5

[Dimensional drawings: 43,5 / 82,8 / 54,4 / 68 / 82,25 / 20,15 / tc[1] / 40 / 81,9]

[1] The tc-point is situated in centre of the bottom side

Ordering data

Type	Article number	Colour temperature[4]	Packaging carton	Weight per pc.
STARK DLE 800-927-965-PRE	89601166	2,700 – 6,500 K	10 pc(s).	0.290 kg
STARK DLE 1800-927-965-PRE	89601165	2,700 – 6,500 K	10 pc(s).	0.282 kg

Specific technical data

Type	Photometric code	Luminous flux[1] [4]	Power consumption system[2]	Luminous efficacy system	Colour rendering index CRI, 2,700 – 6,500 K[4]	Energy classification
STARK DLE 800 PRE	927/3x9 to 965/3x9	800 lm	14.5 W	55 lm/W	> 90	B
STARK DLE 1800 PRE	927/3x9 to 965/3x9	1,800 lm	27.4 W	66 lm/W	> 90	A

All values at ta = 25 °C, tc = 65 °C, 2,700 K.

[1] Tolerance range for optical data: ±10 %.

[2] Tolerance range for electrical data: ±10 %.

[3] If the max. temperature limits are exceeded, the life of the system will be greatly reduced or the system may be damaged.
The temperature of the TALEXmodule at the tc-point is to be measured in the thermally stable state with a temperature sensor
or a temperature sensitive sticker according to EN 60598-1. For the precise position of the tc point see the above diagram.

[4] Colour temperature and CRI according to CIE 1931.

[5] Tunable White is based on the PI-LED® technology. PI-LED® is a trademark of Lumitech.

IP20 SELV □ ⊕ ▽ ⊟ ⚠ C € ⚟ RoHS

TALEXXconverter LCAU 2x20 W one4all

Product description

- LED control gear for PREMIUM modules
- Output power: 2 x 25 W or 1 x 40 W
- Connecting cable, cable cross-section 0.5 – 2.5 mm²
- Power input on standby < 0.5 W
- Strain relief by remote LED control gear
- RJ45 connector for plug & play

Properties

- switchDIM (with memory function)
- colourSWITCH 2,700 – 6,500 K (with memory function)[1]
- New DALI Device Type 8 for Tunable White
- Noise-free precise control via switchDIM or DALI/DSI
- Powerless switching via a digital interface
  (no need for switching via mains)
- Intelligent Temperature Guard (protection against thermal damage)
- Short-circuit shutdown feature with automatic restart (every 7 s)
- No-load shutdown feature with automatic restart (every 7 s)
- Overload protection by restricting output[3]
- SELV
- Plastic casing black
- Type of protection IP20 (remote LED control gear)

In-built LED control gear

Remote LED control gear

Technical data

Rated supply voltage	220 – 240 V
Input voltage range, AC	198 – 264 V
Input voltage range, DC	170 – 264 V
Rated current (at 230 V 50 Hz)	0.21 A
Mains frequency	0 / 50 / 60 Hz
Efficiency	90 %
λ (at 230 V 50 Hz, full load)	0.95
Control input[1] [2]	DSI, DALI, switchDIM, colourSWITCH
Stand-by power[4]	< 0.5 W
Output voltage	49 V ±2 V
Output power	2 x 25 W / 1 x 40 W
Dimming range	15 – 100 %
Set up time (at 230 V 50 Hz)	< 1 s
Switchover time AC/DC and DC/AC	< 1 s
Leakage current (FE)	0.25 mA
ta operating (at life-time 50,000 h)	-20 ... +45 °C
Max. casing temperature tc (at life-time 50,000 h)	65 °C

[1] In DC operation the last set colour is used.

[2] No colourSWITCH at DC operation.

[3] If the overload is too high the LED control gear switches off and tries to restart every 7 s.
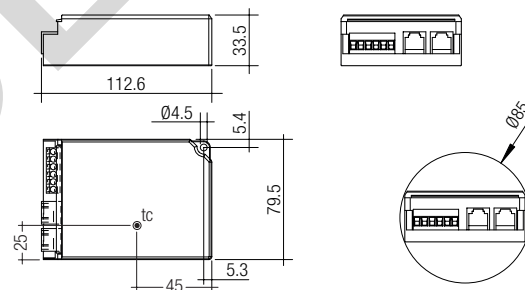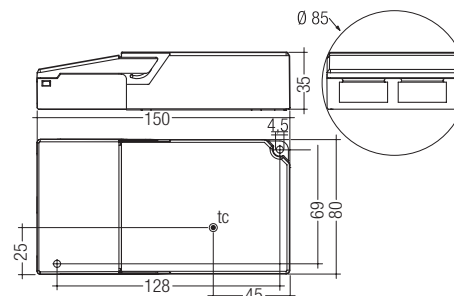
[4] No fan operation on standby.

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Product description, page 8

In-built LED control gear

Remote LED control gear

Ordering data

Type	Article number	Packaging carton	Packaging pallet	Weight per pc.
LCAU 2x020/0048 L010 one4all	86459414	10 pc(s).	560 pc(s).	0,19 kg
LCAU 2x020/0048 L020 one4all	86459108	10 pc(s).	560 pc(s).	0,21 kg

ACCES- SORIES

TALEX‹accessory CONNECT – RJ45 U

Product description

• Connection cable 1 or 2 m for connecting
  TALEX‹moduel STARK DLE and TALEX‹converter LCAU
• RJ45 unshielded

Ordering data

Type	Article number	Lenght	Packaging	Weight per pc.
RJ45/RJ45 U 1.0m	24166480	1 m	1 pc(s).	0.040 kg
RJ45/RJ45 U 2.0m	24166481	2 m	1 pc(s).	0.079 kg

TALEXmodule STARK DLE PREMIUM
Product description

Standards
EN 62031
EN 62471
EN 61347-1
EN 61547
EN 55015

Photometric code

Key for photometric code, e. g. 930 / 359

1st digit		2nd + 3rd digit	4th digit	5th digit	6th digit	
Code	CRI	Colour temperature in Kelvin x 100	McAdams initial	McAdams after 25% of the life-time (max.6000h)	Lumen maintanance after 25% of the life-time (max.6000h)	
					Code	Remaining lumen
7	67 – 76				7	≥ 70 %
8	77 – 86				8	≥ 80 %
9	87 – ≥90				9	≥ 90 %

Thermal design and heat sink
The rated life of TALEX products depends to a large extent on the temperature. If the permissible temperature limits are exceeded, the life of the TALEXmodule STARK DLE will be greatly reduced or the TALEXmodule STARK DLE may be destroyed.

Therefore the TALEXmodule STARK DLE needs to be mounted onto a heat sink.

Tridonic's excellent thermal design for the TALEXmodule products provides the lowest thermal resistance and therefore allowing new compact designs without sacrificing quality, safety and life-time.

tc point, ambient temperature and life-time
The temperature at tc reference point is crucial for the light output and life-time of a TALEXmodule.

For TALEXmodule STARK DLE a tc temperature of max. 65 °C has to be complied in order to achieve an optimum between heat sink requirements, light output and life-time.

Compliance with the maximum permissible reference temperature at the tc point must be checked under operating conditions in a thermally stable state. The maximum value must be determined under worst-case conditions for the relevant application.

Mounting instruction

⚠ TALEXengine STARK DLE from Tridonic which needs cooling for corret operation, has to be connected with heat-conducting paste and fixed with M3 screws to the heat sink or fan.

The fixing/cooling surface must be cleaned before installing the TALEXmodule to remove all dirt, dust and grease.

Max. torque for fixing: 0.5 Nm.

⚠ Chemical substance may harm the LED module. Chemical reactions could lead to colour shift, reduced luminous flux or a total failure of the module caused by corrosion of electrical connections.

Materials which are used in LED applications (e.g. sealings, adhesives) must not produce dissolver gas. They must not be condensation curing based, acetate curing based or contain sulfur, chlorine or phthalate. Avoid corrosive atmosphere during usage and storage.

⚠ **EOS/ESD safety guidelines**

The device / module contains components that are sensitive to electro-static discharge and may only be installed in the factory and on site if appropriate EOS/ESD protection measures have been taken. No special measures need be taken for devices/modules with enclosed casings (contact with the pc board not possible), just normal installation prac-tice. Please note the requirements set out in the document EOS / ESD guidelines (Guideline_EOS_ESD.pdf) at:
http://www.tridonic.com/esd-protection

Temperature monitoring
There is an integrated thermal management system that automatically reduces luminous flux when the critical temperature is reached. It returns to normal opera-tion by itselfs.
This protects the TALEXengine STARK DLE and ensures it reaches its full life-time.

⚠ TALEXengine STARK has to be supplied by TALEXconverter STARK DLE.

Operation with other LED control gears are not allowed.

Heat sink values

TALEXmodule STARKT DLE PREMIUM 800 lm

ta	tc	Rth, hs-a
25 °C	65 °C	1.5 K/W
35 °C	65 °C	1.0 K/W
45 °C	65 °C	0.5 K/W

TALEXmodule STARKT DLE PREMIUM 1.800 lm

ta	tc	Rth, hs-a
25 °C	65 °C	0.8 K/W
35 °C	65 °C	0.5 K/W
45 °C	65 °C	0.2 K/W

Notes

Values valid for: natural convection, heat sink material: aluminium ≥ 1 mm thick, $R_{th, hs-a}$ = required thermal resistance of heat sink

The actual cooling surface can differ because of outside influences and the installation situation. A thermal connection between TALEXmodule and heat sink with heat-conducting paste or heat conducting adhesive film is absolutely necessary.
Additionally the TALEXmodule has to be fixed on the heat sink with M3 screws to optimise the thermal connection.

Thermal behaviour

storage temperature	-20 ... +65 °C
operating temperature	-20 ... +55 °C
tc max. (at typ. current)	65 °C
max. humidity	0 ... 80 %

Ambient

TALEXmodule STARK DLE is designed for inbuilt applications. It has no IP protection.

Terminal

RJ45

FAN Out 12 V
Molex (Part number: 0050579502)
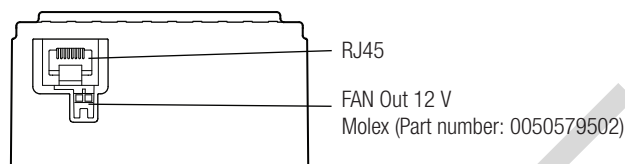
Fan output

Output voltage	12 V
Max. current	0.15 A

Pin configuration
Molex (Part number: 0050579502)

PIN	Signal
1	+
2	−

Lumen maintenance

| tc temperature in °C	luminous flux in %	operating time in h
	80	60,000
25	70	81,000
	50	132,000
	80	44,000
45	70	64,000
	50	110,000
	80	32,000
65	70	50,000
	50	91,000

Optical characteristics TALEXmodule STARK DLE

The optical design of the TALEXmodule STARK DLE product line ensures optimum homogenity for the light distribution.

Light distribution
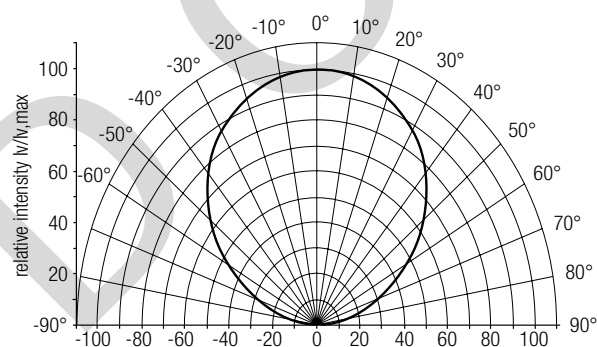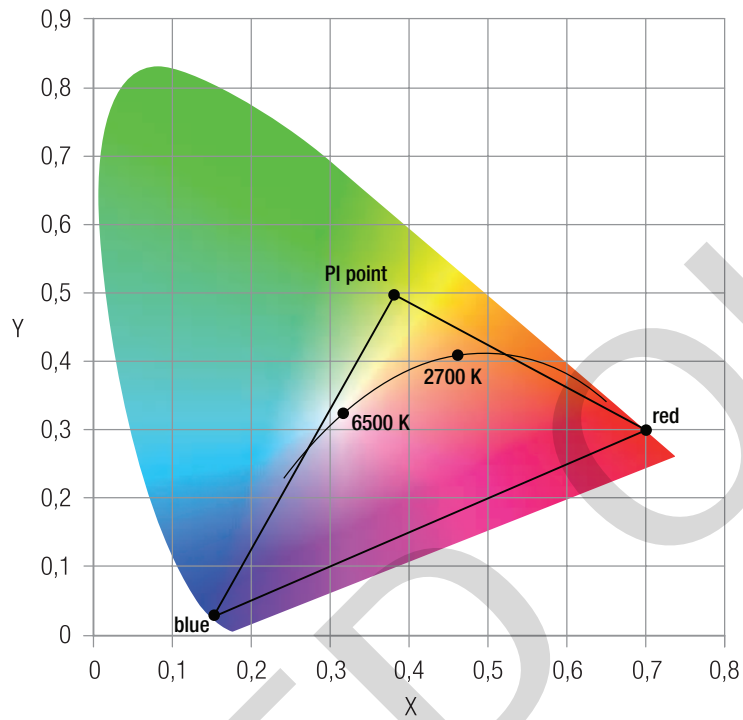

Relative luminous flux vs. colour temperature
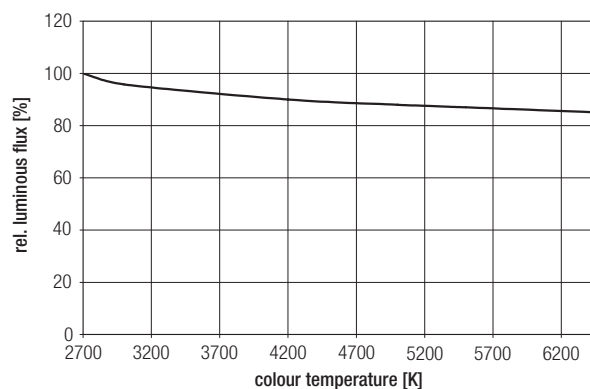
The diagrams are based on statistic values.

For further information see Design-in Guide, 3D data and photometric data on www.tridonic.com or on request.

Coordinates and tolerances according to CIE 1931

The ambient temperature of the measurement is ta = 25 °C.
The measurement tolerance of the colour coordinates are ± 0.01.

6,500 K

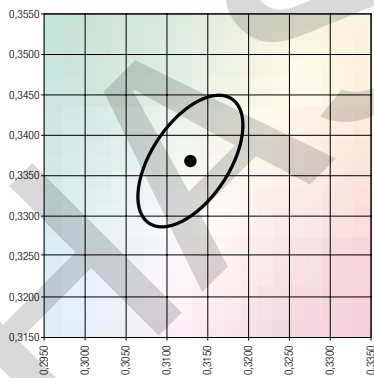|	x0	y0
Centre	0.3130	0.3370

MacAdam ellipse: 3SDCM

2,700 K

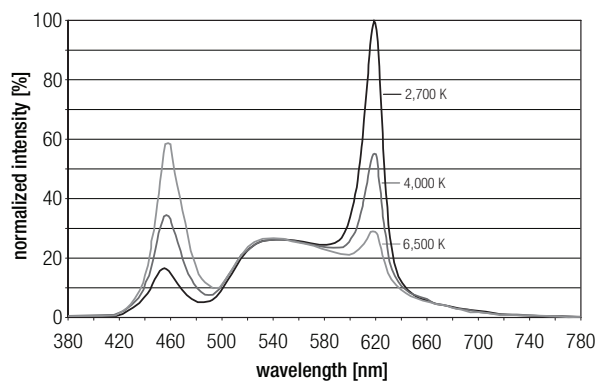|	x0	y0
Centre	0.4630	0.4200

MacAdam ellipse: 3SDCM
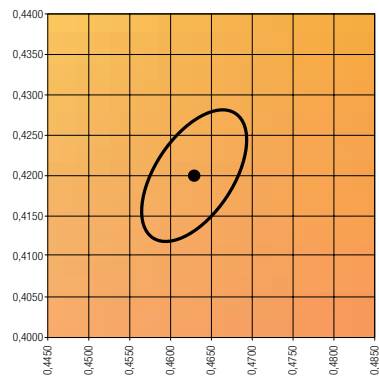
Colour spectrum at different colour temperatures

TALEXconverter LCAU 2x20 W one4all
Product description

Standards
EN 55015
EN 61000-3-2
EN 61000-3-3
EN 61347-1
EN 61347-2-13
EN 62384
EN 62386-101
EN 62386-102
EN 62386-207
EN 62386-209 (DALI DEVICE Type 8)
according to EN 50172 (only valid for central batteries systems)

Glow wire test according to IEC 60695-2-11
960 °C passed.

Control input (DA/D1, DA/D2)
Digital DALI signal or switchDIM can be wired on the same terminals (DA/D1 and DA/D2).

Digital signal DALI/DSI
The control input is non-polar and protected against accidental connection with a mains voltage up to 264 V. The control signal is not SELV. Control cable has to be installed in accordance to the requirements of low voltage installations. Different functions depending on each module.

Colour types
Supported colour types according to DALI-Device Type 8:
- xy-coordinates
- colour temperature tc

Thermal protection of the unit
The unit also has an ITG (Intelligent Temperature Guard). This protects the TALEXconverter LCAU 2x20 W one4all from thermal overload by reducing the output power or switching off in case of operation above the thermal limits of the luminaire or ballast. Depending on the luminaire design, the ITG operates at about 8 °C (±5 °C) above tc temperature.

Control via switchDIM
A conventional double pushbutton switch can be used for control via switchDIM. One of the pushbuttons is used to set the colour temperature, the other to set the dimming level.

⚠ Pushbuttons with glow lamps affect the switchDIM, colourTEMPERATURE and colourSWITCH functions and should therefore not be used for this purpose.

For control via a switchDIM switch different settings can be made:
- Setting for the colour temperature via colourTEMPERATURE mode or colourSWITCH mode with 8 predefined values between 2,700 K and 6,500 K.
- Stepless setting for the dimming level between 15 % and 100 %.

The colourTEMPERATURE mode and colourSWITCH mode differ in the position of the individual colour values along the Planckian curve. The colourTEMPERATURE mode is designed to meet the requirements of general and shop illumination, whereas the colourSWITCH mode is designed for food lighting.

On start-up the device first activates colour temperature setting in the colourTEMPERATURE mode. The starting values are a colour temperature of 2,700 K and a dimming level of 100 %.
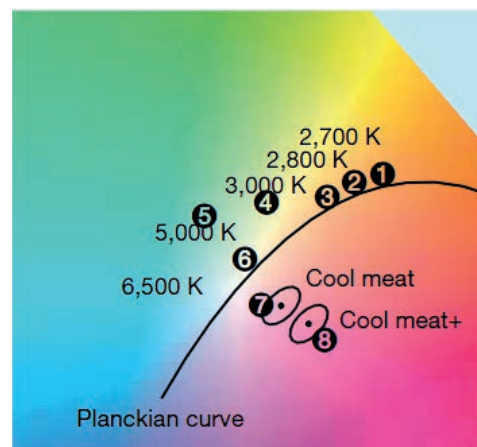
colourTEMPERATURE mode
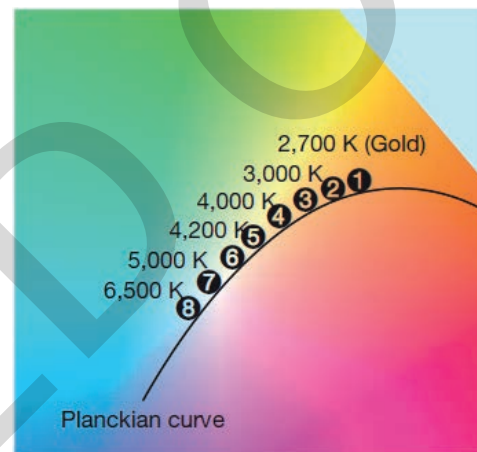
Location of the colour temperatures along the Planckian curve

1	2,700 K	5	4,500 K
2	3,000 K	6	5,000 K
3	3,500 K	7	5,700 K
4	4,000 K	8	6,500 K

colourSWITCH mode

Location of the defined colour temperatures

1	Gold (2,700 K) for bread and cakes	5	Cheese yellow, x = 0.35, y = 0.38
2	2,800 K, fruit and vegetables	6	5,000 K
3	3,000 K	7	Cool Meat, x = 0.3630, y = 0.3070
4	Fish, x = 0.38, y = 0.38	8	Cool Meat+, x = 0.3827, y = 0.2960

Setting the colour temperature
The procedure for setting the colour temperature is identical for both the colourTEMPERATURE mode and the colourSWITCH mode:
• Press the pushbutton briefly (approx. 1 s) to advance the colour temperature by one value

⚠ Once the maximum value has been reached, the next press takes you directly back to the minimum value.

Changing the mode
To toggle between colourTEMPERATURE mode and colourSWITCH mode you need to hold down the pushbutton. After 10 and 15 seconds the device will flash briefly. These are known as the 1st and 2nd flashing phases. Depending on the flashing phase in which the pushbutton is released (1st or 2nd), the changes are as follows:
• 1st flashing phase (after about 10 s): The device changes from colourTEMPERATURE mode to colourSWITCH mode
• 2nd flashing phase (after about 15 s): The device changes from colourSWITCH mode to colourTEMPERATURE mode

⚠ If the pushbutton is released more than 5 seconds after the 2nd flashing phase this cannot be assigned to either flashing phase and will be ignored.
This can be used to avoid incorrect entries.
If the right time for releasing the pushbutton has passed all you need to do is to allow the appropriate time to elapse and start the process again.

For further information please refer to to the brochure entitled "Technical Design-In-Guide DLE".

Dimming
Dimming range 15 % to 100 %
Digital control with:
• DSI signal: 8 bit Manchester Code
  Speed 15 % to 100 % in 1.4 s
• DALI signal: 16 bit Manchester Code
  Speed 15 % to 100 % in 0.1 s
  Programmable parameter:
  Minimum dimming level
  Maximum dimming level
  Default minimum = 15 %
  Programmable range 15 % ≤ MIN ≤ 100 %
  Default maximum = 100 %
  Programmable range 100 % ≥ MAX ≥ 15 %

Dimming curve is adapted to the eye sensitiveness.

Dimming characteristics

Digital dimming value
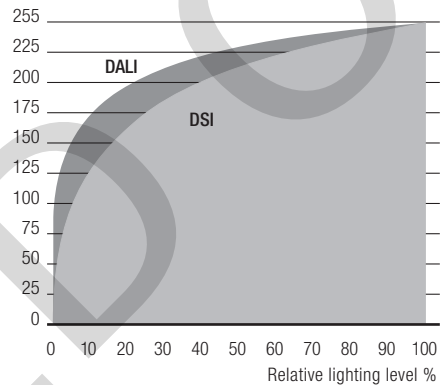
Dimming characteristics as seen by the human eye

Maximum loading of automatic circuit breakers

Automatic circuit breaker type	C10	C13	C16	C20	B10	B13	B16	B20	Inrush current	
Installation Ø	1.5 mm²	1.5 mm²	1.5 mm²	2.5 mm²	1.5 mm²	1.5 mm²	1.5 mm²	2.5 mm²	I_{max}	time
LCAI 2x020/0048 L0xx one4all	10	14	18	24	5	7	9	12	38 A	256 µs

Harmonic distortion in the mains supply (at 230 V / 50 Hz and full load) in %

Type	THD	3	5	7	9	11
LCAI 2x020/0048 L0xx one4all	< 13	9	5	4	3	2

Installation instructions

Wiring type and cross section (mains supply)
Stranded wire with end ferrule with a cross section up to 0.5 mm² or solid wire up to 2.5 mm² may be used for wiring.

For mains-side through-wiring on a single terminal we recommend the use of the same wire cross section.

max. Ø = 9,7 mm
min. Ø = 6,3 mm
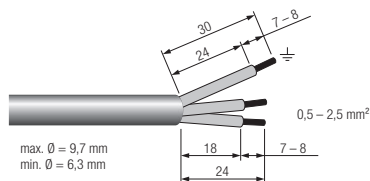
Terminals
Screw type M3
Torque 0.5 Nm

Connection earth
To keep the EMV guidlines the earth has to be connected.

Storage conditions
Humidity: 5 % up to max. 85 %,
not condensed
(max. 56 days/year at 85 %)

Storage temperature: -40 °C up to max. +80 °C

The devices have to be within the specified temperature range (ta) before they can be operated.

Connection TALEXmodule STARK DLE PREMIUM (SEC)

Connection: 2x RJ45

For the connection between TALEXconverter and TALEXmodule STARK DLE PREMIUM you have to use Tridonic specific cables.
Don't use a standard ethernet cable.

art.-no.: 24166480   (length: 1 m)
art.-no.: 24166481   (length: 2 m)

TALEXconverter LCAU 2x20/0048 L0xx is suitable for operating the following LED modules:

• TALEXmodule STARK DLE 800 PREMIUM (art.-no. 89601166)
• TALEXmodule STARK DLE 1800 PREMIUM (art.-no. 89601165)

Product label

Possible connections

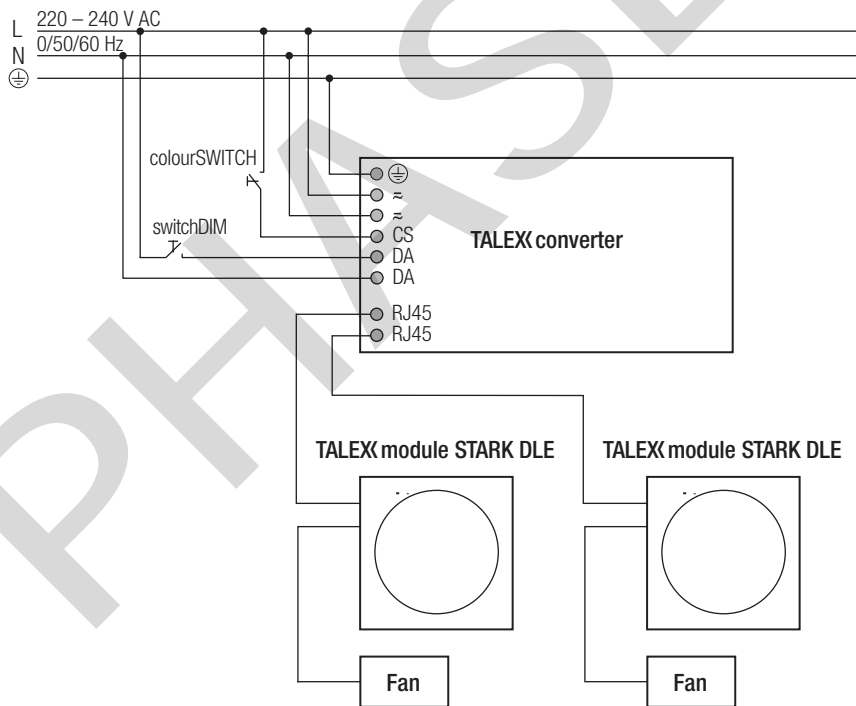|	Number of TALEXmodule STARK DLE PREMIUM per LED control gear		Operation with fan possible
	DLE 800 PRE	**DLE 1800 PRE**	
combination 1	2	–	NO
combination 2	1	–	YES
combination 3	–	1	YES

Note
The operation with a fan is only possible with one TALEXmodule STARK DLE PREMIUM connected.
No fan operation on standby.

Wiring diagram for switchDIM and colourSWITCH for TALEXengine STARK DLE PREMIUM
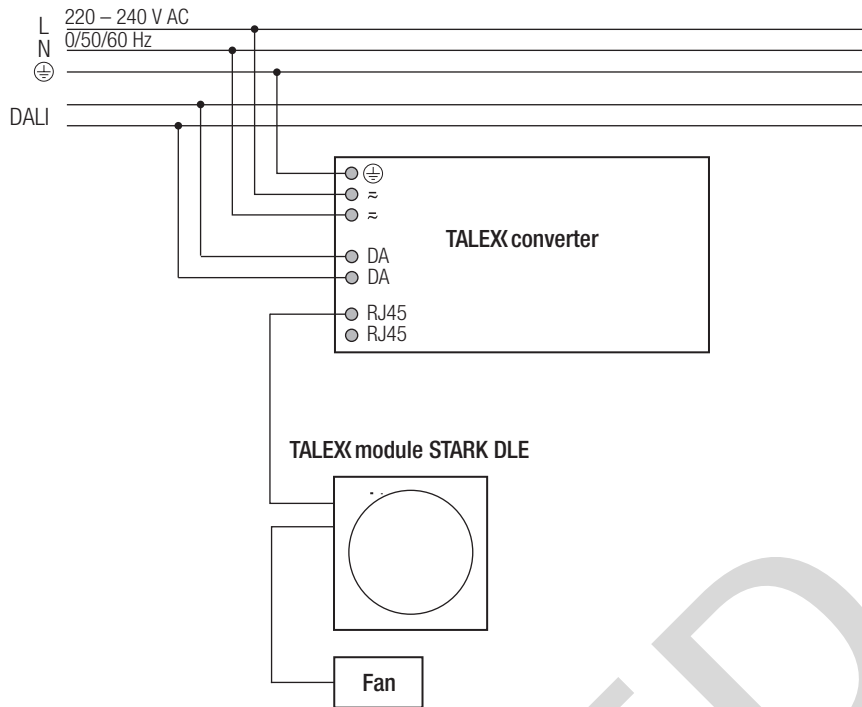
Operating with one TALEXmodule STARK DLE PREMIUM
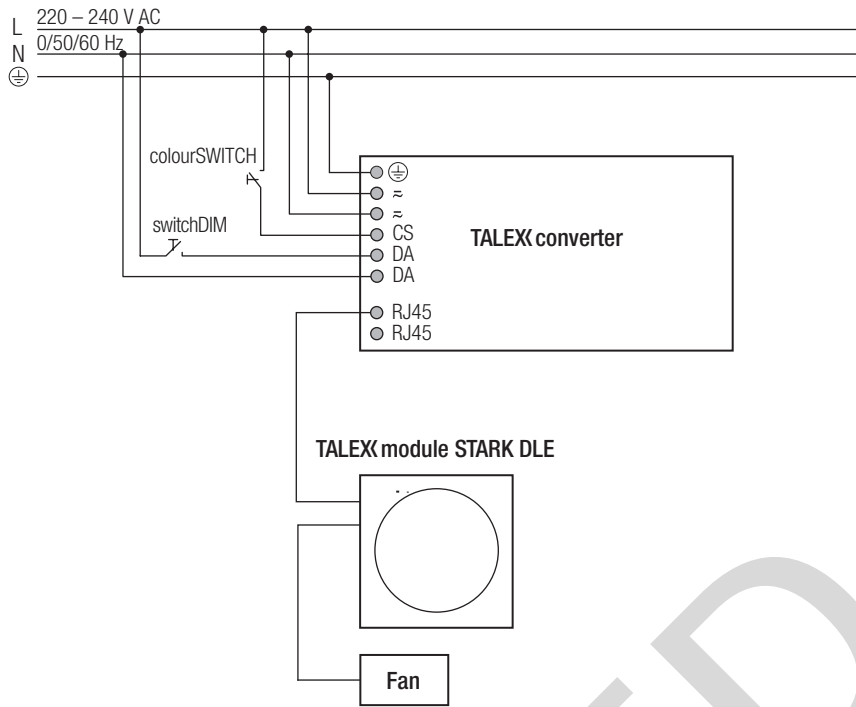
Operating with two TALEXmodule STARK DLE PREMIUM

Wiring diagram for DALI for TALEXengine STARK DLE PREMIUM

Operating with one TALEXmodule STARK DLE PREMIUM

Operating with two TALEXmodule STARK DLE PREMIUM