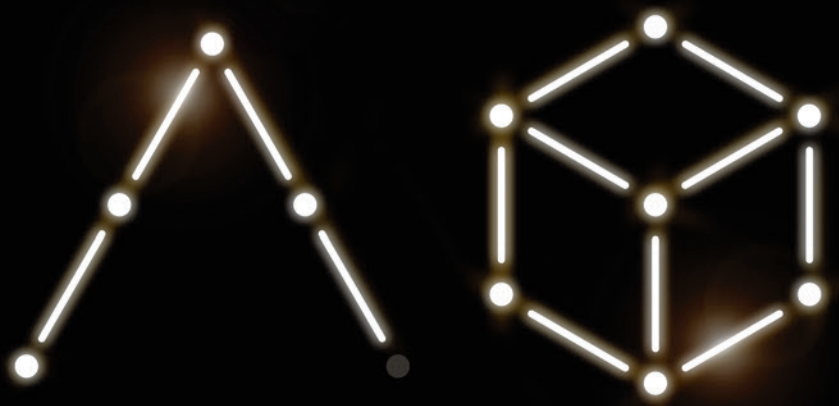
LED LINEAR™
lighting solutions

Member of the
Fagerhult Group



IN.finite LED control gear

Connect and control

LINEAR

MODULAR

INFINITE

IN.finite

Shed a new light on lighting control

The IN.finite LED control gear has two independently controllable output channels which can be freely chosen to control two mono light lines or a tunable white light lines (with cold white and warm white) or to implement a Dim-to-Warm solution.

IN.finite LED control gear platform

The most advanced and versatile LED control gear

IN.finite is the most advanced LED control gear engineered at LED Linear™. The IN.finite family unleashes the full potential of LED Linear's well established innovation in the field of LED tapes. The programming and control of dim to warm or tunable white scenes based on IQ White tapes and tunable white luminaires becomes effortless without a compromise on the light quality.

IN.finite CASAMBI, scale 1:1

IN.finite DALI DT6, scale 1:1

IN.finite DALI DT8, scale 1:1

Features

FLICKER FREE DIMMING

Pulse Width Modulation (PWM) dimming from 100 % down to 0 % at 1.6 KHz with non visible flicker.

With PWM obtain smooth, precise and excellent color consistent mixing in combination with LED Linear's flex tapes.

Avoid adverse health risks with PWM dimming at very high frequency of 1.6 KHz that has non visible flicker with no observable effect level (NOEL).

TWO INDEPENDENT OUTPUT CHANNELS

Two output channels CH1 & CH2

Control each output channel independently, for example two mono light lines.

PERFECT DIM-TO-WARM & TUNABLE WHITE

Freely choose a dimming curve according to the application* and which are optimised with LED Linear's flex tapes.

Dim-to-Warm – Mimicing the traditional old halogen lamps, design a warm, pleasant and relaxed atmosphere with Dim-to-Warm.

Tunable white – Color of natural light changes during the course of the day, achieve this behavior with tunable white and design a environment which boosts concentration and efficiency.

Logarithmic – The human eye does not perceive changes in brightness in a linear fashion. Brightness of the LED's can be matched to the way human eyes behave with logarithmic curves.

100 % POWER OUT IN TUNABLE WHITE LUMINAIRE

Primary-N color control mode in DALI DT8 gives 100 % power at the output.

IN.finite DALI DT8 in Primary-N mode delivers 100 % of the available tape power at the output unlike other DT8 systems which provide only 50 % of the maximum tunable white luminaire output.

LONG RUN LENGTH DETERMINED BY THE WIDE INPUT RANGE

Input voltage range
(12 V, 24 V or 48 V @8 A)

Input power range 96 – 384 W

IN.finite family delivers output power up to 192 W @24 V_{in} enabling to connect approx. 18.2 m @24 V_{in} with cove lighting in white or 6.4 m with cove lighting in tunable white 10 W/m.

ADVANCED DESIGN FEATURES

Remarkably compact (188 x 21 x 30 mm) which can be built in luminares or used as standalone component.

Very compact dimensions of the IN.finite family offer seamless integration of the control gear in remote installations such as false ceilings or in coves.

IN.finite family has identical formfactor, they can be implemented in CASAMBI or DALI (DT6 & DT8) networks without any performance trade offs.

* For IN.finite CASAMBI only.

More functionality and flexibility

CASAMBI | Features

The IN.finite is designed to give smart control over luminaires. The mesh communication built on Bluetooth Low Energy (BLE) offers fast, reliable and safe transmission. This scalable system allows to connect up to 250 units to one network. The application areas include indoor as well as outdoor*.

The intuitive user interface allows users to

- Switch ON/OFF, dim, adjust color and color temperature of a luminaire or a group of luminaires
- **Network:** Create a network with different user access rights: Not shared, Open, Administrator or Password protected
- **Gallery:** Take photos of a space & mark directly the luminaire positions in the gallery feature
- **Scenes:** Easily configure, save and recall scenes and animations or launch predefine scenes faster than light
- **More:** Trigger scenes or ON/OFF cycles based on calendar/time or sunset/sunrise
- **iBeacon:** Use the Bluetooth signal strength for location intelligence
- Get the system status and easily update the system over-the-air

The self organizing scalable wireless mesh topology removes any single point of failure.

Each fixture becomes a smart fixture as the intelligence is replicated in each IN.finite CASAMBI unit.

Sensors (e. g. Motion, Daylight) can be integrated into the wireless network.

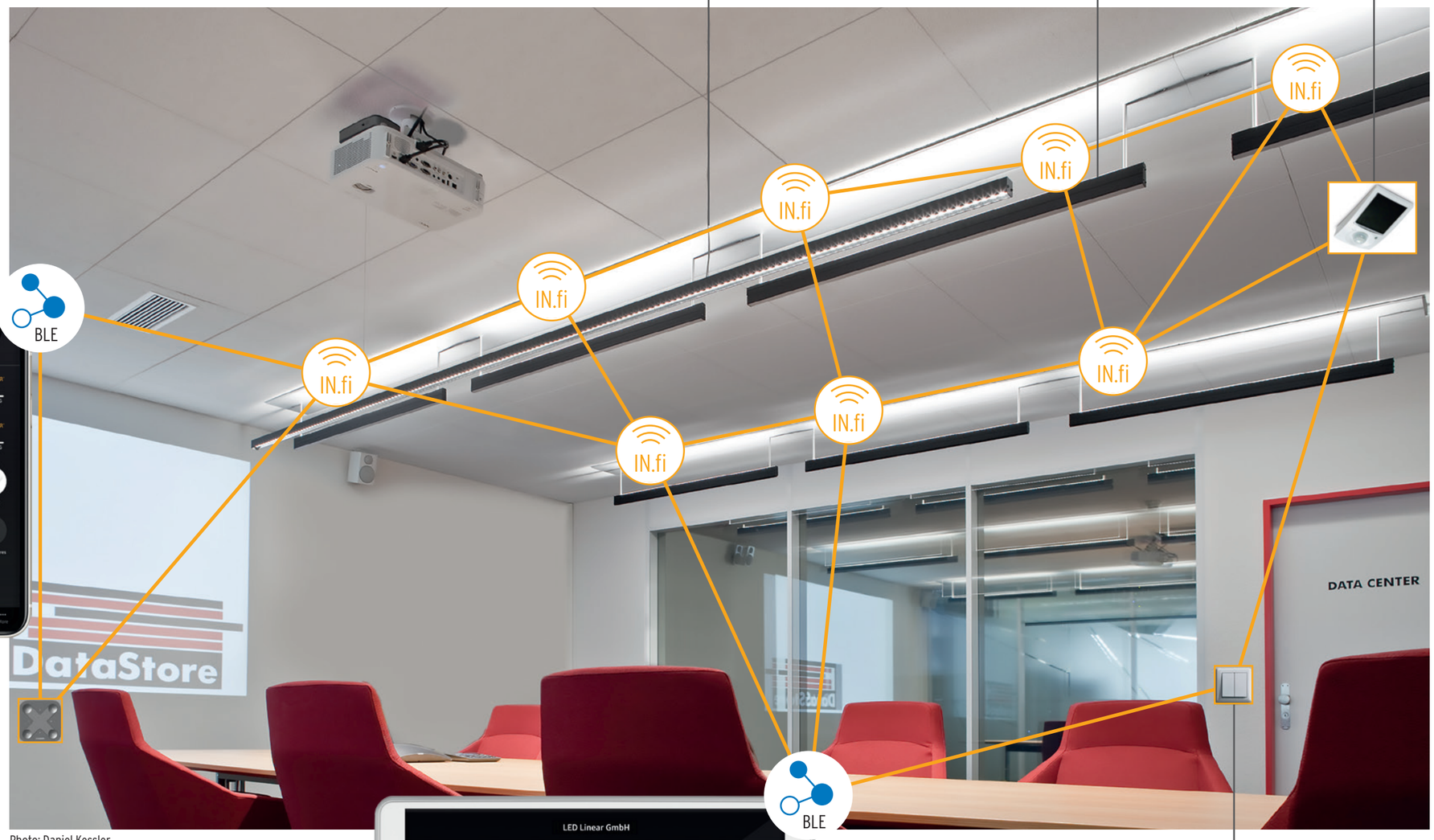


Photo: Daniel Kessler

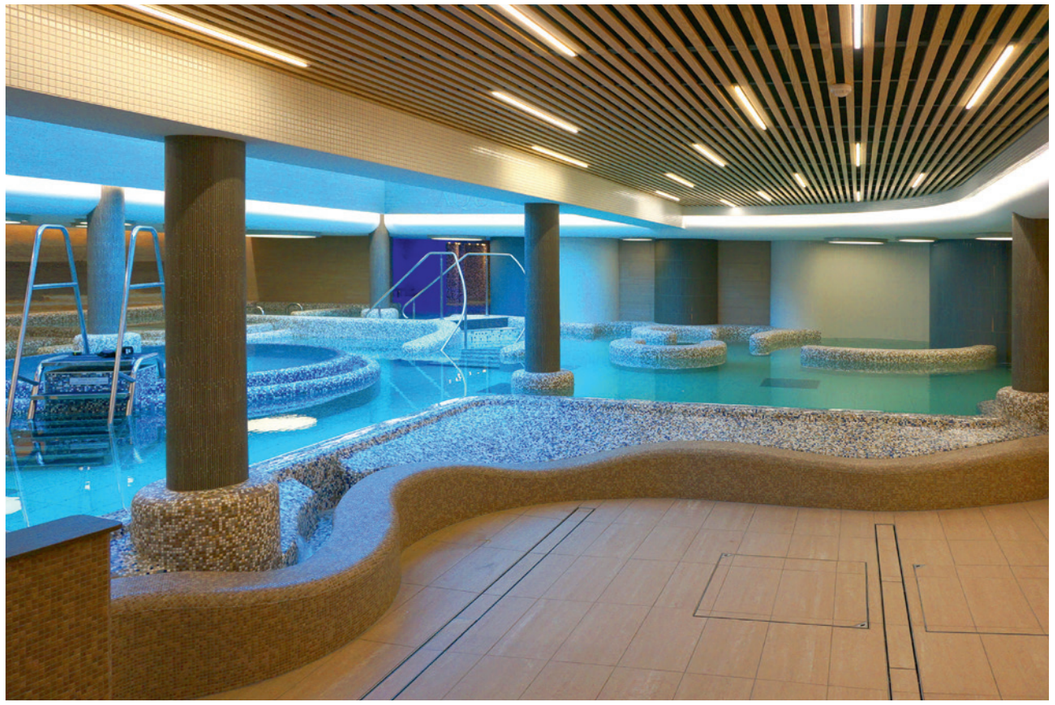
CASAMBI

*IN.finite encased in a non metallic IP rated protection box.

More functionality and flexibility

CASAMBI | Dim-to-Warm & Tunable white

Dim-to-Warm



The old traditional halogen or incandescent lamps when dimmed emit red and orange hues. To mimic the dimming behavior of the old lamp in LED's "Dim-to-Warm" is introduced. The intensity and color temperature of the LED luminaires can be adjusted at the same time in Dim-to-Warm. The Dim-to-Warm feature in LED fixtures brings together the energy saving benefits of LED's whilst designing a warm, pleasant and relaxed atmosphere.

The IN.finite CASAMBI LED control gear developed by LED Linear™ is equipped with the Dim-to-Warm feature. The color is controlled linearly and the intensity is controlled logarithmically at the same time to produce the dimming behavior as in the old lamps.

Features

- Automatically adjust the color temperature by the intensity level
  high intensity = colder light
  low intensity = warmer white (mimicking an old lamp behavior)
- Maximum intensity of the luminaire is 100%
- Dim-to-Warm is achieved only with one slider in the App interface and the resulting color temperature is mix of both channels

Tunable White Light (TWL)

Photo: Derek Hudson

Color of the natural light from sun changes over the course of the day. During morning and evening hours the color is warm white (ww) and during the midday the color changes to cool white (cw). Tunable white supports this variable color temperature from warm and cool white light in a LED fixture.

The tunable white feature in LED fixtures creates a stimulating environment which increases concentration and productivity in humans. The color temperature and the intensity can be set individually with the IN.finite CASAMBI LED control gear developed by LED Linear™.

Features

- Adjust the color temperature and intensity level separately
  6,500 K = colder light
  2,500 K = warmer light
- Maximum intensity of luminaire varies as it is dependent on the chosen color temperature
- Depending on the lighting design, the flex tapes from LED Linear™ can be optimized to work at a particular color temperature

More functionality and flexibility

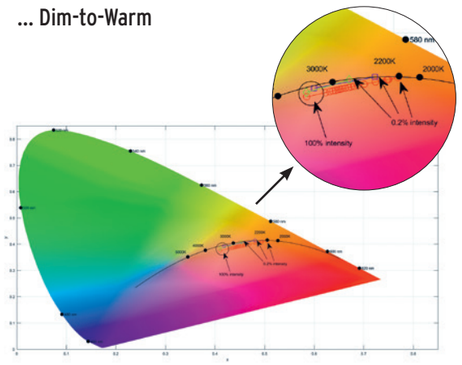
CASAMBI | Dimming curves

A black body curve represents the ideal color temperature profile of a white light. The IN.finite LED control gear actively controls the mixing ratio of warm white and cold white LED's and thus mimics a very accurate color gradient along the black body curve. This intelligent mixing results in a Dim-to-Warm range of approx. 3,500 K down to 2,200 K and in tunable white a range of approx. 6,500 K down to 2,200 K.

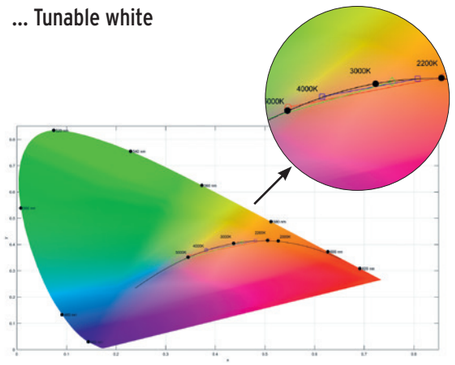
The predefined Dim-to-Warm and tunable white dimming curves provided by the In.finite CASAMBI for VarioLED™ Flex IQ White NEXUS, VarioLED™ Flex IQ White SOL, VarioLED™ Flex IQ White HYDRA are optimized to follow the ideal black body curve.

CIE color chart showing the black body curve and LED Linear's flex tapes for ...

... Dim-to-Warm



... Tunable white



IQ White NEXUS HD/LD IQ White HYDRA LD IQ White SOL LD

CASAMBI App interface

Load the right profile before adding the unit to the network

Predefined profiles in the App interface

Dim-to-Warm	D2W_HYDRA	Profile for VarioLED™ Flex IQ White HYDRA From 2,500 K to 3,250 K
	D2W_NEXUS	Profile for VarioLED™ Flex IQ White NEXUS From 2,200 K to 3,250 K
	D2W_SOL	Profile for VarioLED™ Flex IQ White SOL From 2,500 K to 3,340 K
Tunable white	TW_HYDRA	Profile for VarioLED™ Flex IQ White HYDRA From 2,500 K to 4,000 K
	TW_NEXUS	Profile for VarioLED™ Flex IQ White NEXUS From 2,200 K to 5,000 K
	TW_SOL	Profile for VarioLED™ Flex IQ White SOL From 2,500 K to 6,500 K
Logarithmic & Linear	2CH_LOG	Profile for all VarioLED™ Flex tapes
	2CH_LINEAR	Profile for all VarioLED™ Flex tapes

More functionality and reliability

DALI DT6/DT8 | Features

IN.finite LED control gear is also availabe in the widely adopted DALI version. They include the device type 6 (DT6) and the device type 8 (DT8).

Which DALI version is best suited for your application, DT6 or DT8 ?

- DT6 is the go to solution for LED modules with basic functionality of ON/OFF or dimming. Color control can definitely be implemented at the cost of time and requires very complex implementation steps in large installations**.
- Each channel in DT6 needs to be individually addressed. For example, in a tunable white light (TWL) application, a DALI network can accommodate maximum **32 addresses** and this increases cost.

DALI network can have maximum 64 addresses

1 TWL fixture	=	1 warm white + 1 cool white
1 TWL fixture	=	2 addresses
Max. 64 addresses per DALI line	=	32 TWL fixtures per DALI line

- DT8 is a solution for LED modules with color control. Color control is introduced through the new concept of color type. Two color types – Primary-N and Color temperature* have been implemented on IN.finite DALI DT8.
- In DT8, two or more channels can be controlled over a single address. For a tunable white light (TWL) application, a DALI network can have **64 addresses**. This means it can accommodate more devices when compared to DT6 and will in turn reduce costs in large installations.

DALI network can have maximum 64 addresses

1 TWL fixture	=	1 warm white + 1 cool white
1 TWL fixture	=	1 address
Max. 64 addresses per DALI line	=	64 TWL fixtures per DALI line

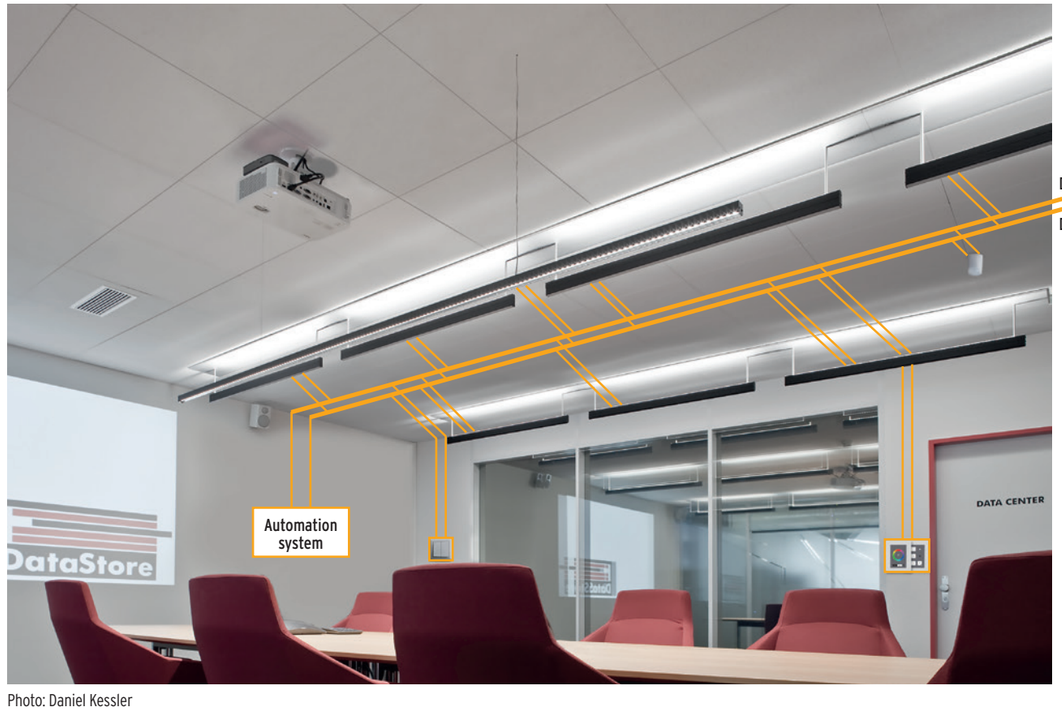


Photo: Daniel Kessler

* Coming soon

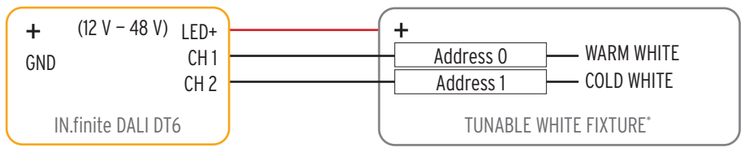
** More than 64 addresses

DALI DT6/DT8 | Color control

IN.finite

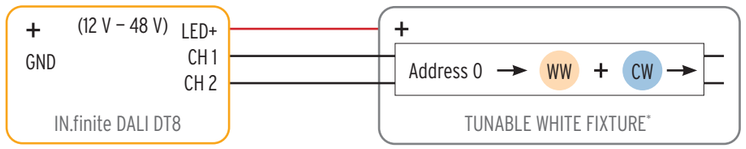
DT6 color control

In DT6, the output light color and intensity of each channel cannot be directly controlled.
It must be defined and configured with complex commissioning steps during installation.



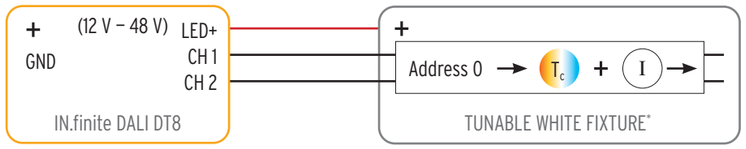
DT8 color type: Primary-N

In DT8 Primary-N color type, the output light color and intensity of each channel is directly controlled.



DT8 color type: color temperature**

In DT8 color temperature** type, the output color temperature of each channel is directly controlled and the intensity is set separately. In this color type there is always a compromise between the power and lumen output.



Please note that the IN.finite LED control gear can also be connected to mono fixtures.
For more information, please download the data sheets from our website to see this wiring connection.

* Not included. To be ordered separately

** Coming soon

DALI DT6/DT8 | Choosing the right IN.finite unit

	IN.finite CASAMBI	IN.finite DALI DT6	IN.finite DALI DT8
Protocol	BLE wireless	DALI - Hard wired	DALI - Hard wired
Devices per network (max.) E. g. in TWL	250	32	64
Network topology	Mesh	Tree	Tree
Color control	Dimming curves are predefined. Dim-to-Warm & tunable white readily available with IN.finite CASAMBI	Partial Dimming of each channel is possible and time consuming to program	Easy color mixing - New feature of color control modes - 1. Primary-N 2. Color temperature
Commissioning for color control	Easy commissioning and configuration via CASAMBI App	Complex and expensive - Intensive planning steps involved for cabling and for grouping	Faster and easier commissioning - Through the new feature of color control, new commands are available making commissioning faster and easier
Power out of tunable white luminaire	Dim-to-Warm: 100 % Tunable white: dependent on the chosen color temperature	100 %	Primary-N: 100 % Color temperature: 50 %

Technical information

CHARACTERISTICS

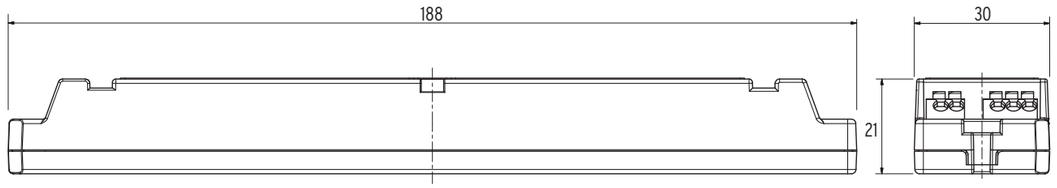
Input characteristics:

Input voltage	12 – 48 V_{DC} (V_{IN} = V_{OUT})
Input current (max.)	8 A
Input power (max.)	96 – 384 W @ 12 – 48 V_{DC}

Output characteristics:

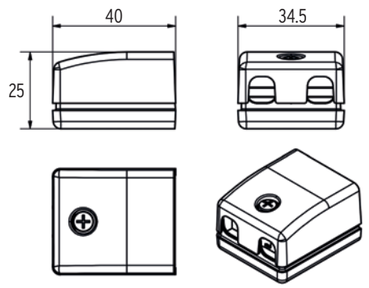
LED Outputs	2
Output voltage	V_{IN} = V_{OUT}
Output current	I_{IN} = I_{OUT} (max. 2 x 4 A)

DIMENSIONS (in mm)

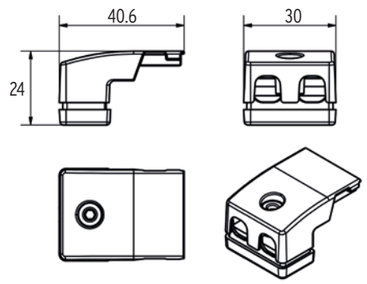


ACCESSORIES: END CAPS (in mm)

VarioPSU Slim Cap Stand-alone (Set of 2)



VarioPSU Slim Cap (Set of 2)



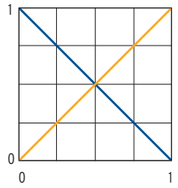
CONTROL CHARACTERISTICS

PWM dimming	f ≈ 1.6 KHz
Available protocols	Bluetooth 4.0 Low Energy, DALI DT6, DALI DT8
Dimming range	0 % – 100 %
Dimming resolution	CASAMBI 625 steps ≈ 9 bit DALI 256 control values ≈ 12 bit

For more detailed technical information, please download the data sheets from our website **www.led-linear.com**

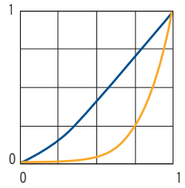
DIMMING CURVE SELECTION

Tunable white



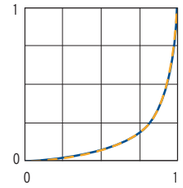
IN.finite CASAMBI
IN.finite DALI DT8*

Dim-to-Warm



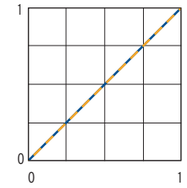
IN.finite CASAMBI

Logarithmic



IN.finite CASAMBI
IN.finite DALI DT8
IN.finite DALI DT6

Linear



IN.finite CASAMBI

ORDER INFORMATION

Description	Article Number
IN.finite CASAMBI 2Ch CV	16000267-EVO
IN.finite DALI DT6 2Ch CV	16000268-DT6
IN.finite DALI DT8 2Ch CV	16000268-DT8
VarioPSU Slim Cap Stand-alone	14000068
VarioPSU Slim Cap	16000091

Applications

APPLICATION AREAS

Restaurants & Residential

Mimic the dimming behaviour as in old halogen lamps using Dim-to-Warm, design a pleasant and relaxed atmosphere with VarioLED™ Flex IQ White HYDRA.

Office & Museum

Color of the natural light changes during the course of the day, achieve this behaviour with tunable white, design a space which activates and promotes concentration with VarioLED™ Flex IQ White SOL.

LIGHTING APPLICATIONS

Individualised task lighting

Customization of individual light (warm or cold/bright or dim) according to personal preference and achieve a efficient environment. Task lighting can be realised easily in combination with LED Linear's MARS NANO or LYRA.

Cove lighting

A type of indirect or accent lighting providing an overall diffusive illumination, realised by mounting the luminaire in wall or celling. Easily implement cove lighting in combination with LED Linear's XOOCOVE.

General lighting

A uniformly illuminated area with comfortable brightness to enable everyday tasks to be performed comfortably and efficiently.

* Coming soon.

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