Program
OSRAM Digital Systems Lighting Seminar 2017

When	What	Who (remark)
19 Oct. 2017		
16:30	Reception	
16:50-17:10	Welcome & Opening Speech	Mr. Wilhelm Cheng
	Greeting	Mr. KB Kim
17:10 -18:10	LE, OT & LMS new products	Mr. Robin Cheng Mr. Jonathan Ho Mr. Rock Chen
	Q&A	
18:10 -19:00	Demonstration	Product display
19:00 -20:00	Wine & Dine	All participants
20:00	End	

Osram BU DS APAC
LE New Product Introduction
Korea

LE APAC | 19 Oct., 2017 | Seoul

OSRAM

BU DS – APAC Roadmap

-- Application and Segmentation

FY18

FY19

LESD

Coin COB G1

Coin AC G2

Core Pro/Mini

Basic Flat AC G2

AC IoT Module

LECV

Value Flex G3

Value Flex G3 Plus (WW, CW)

Linear Rigid (Shelf)

Value Flex G3 Plus (Mono, TW)

FreezerLight G2

Linear Rigid GI

Signage

BackLED Eco Plus

BackLED Eco

BackLED M Plus HO

BackLED Eco Rigid Linear

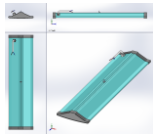
BoxLED Side M Plus

BoxLED Side indoor L Plus

LELA

Basic Linear AC G1

HO Round IP Module



Linear IP Module

SKY Cost Down

Basic Linear G2

Shop | Signage | Industrial/Infrestructure | Office

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LECV Flex

--- Portfolio Segmentation

LINEARLight Flex

LF Non-IP

LF IP67

LF Diffuse

- 5 years warranty
- 50kh
- CRI>80
- Constant working current
- Easy cut & connect with CONNECTsystem
- VDE, CE, UL

Value Flex

VF Non-IP

VF IP66

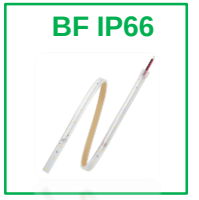
VFP IP66

- 3 years warranty
- 35kh
- CRI>80
- Constant working current
- Easy cut & connect with CONNECTsystem
- CE

Basic Flex

BF Non-IP

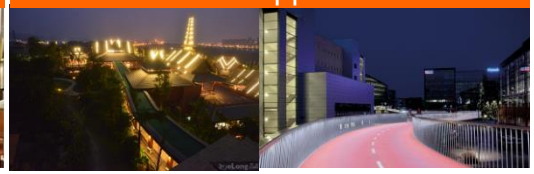
BF IP66



- 2 years warranty
- 20kh
- CRI>80
- Only resistors to limit working current
- Easy cut & connect with connectors

ndoor Application

Outdoor Application



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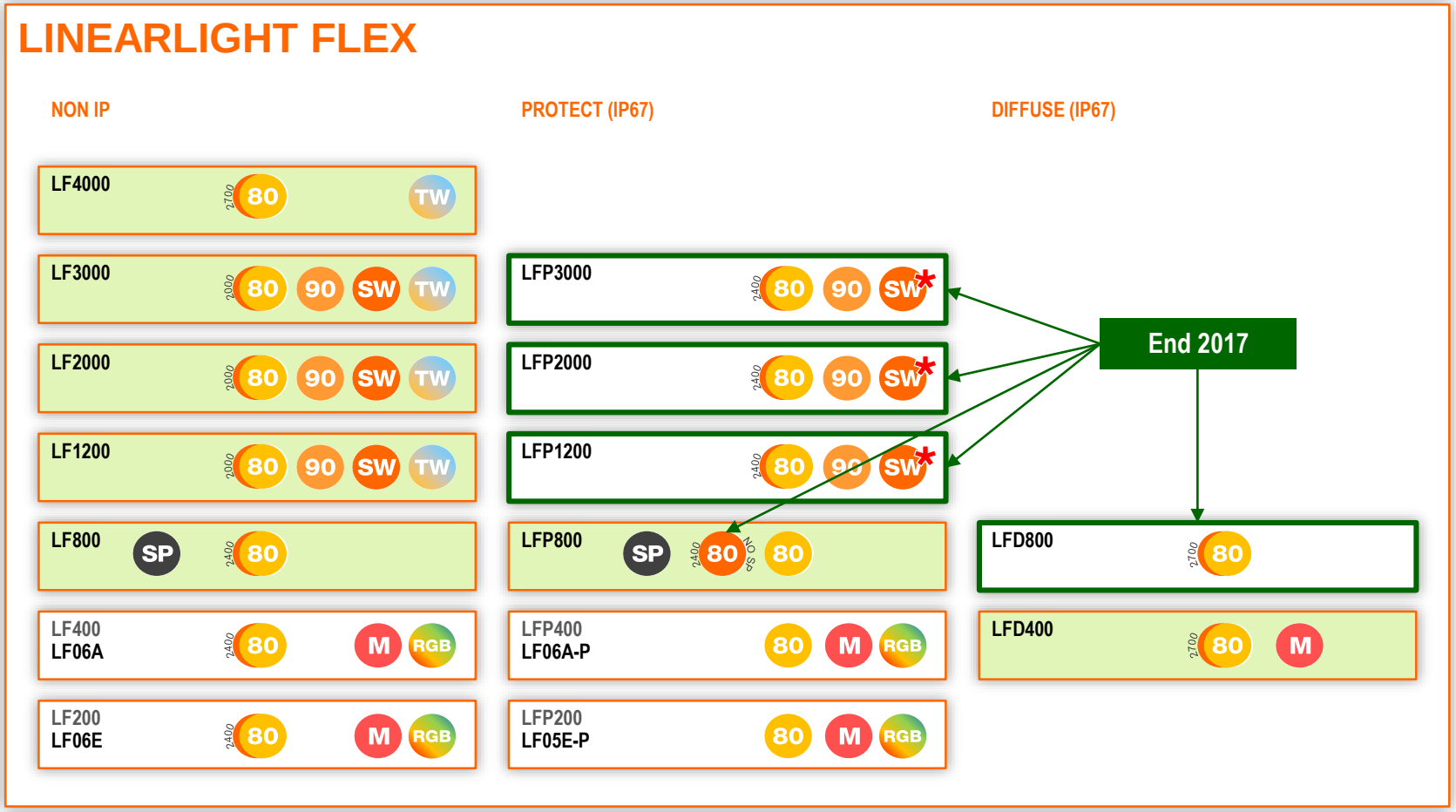
LECV Flex
Linearlight Flex

SP SHORTPITCH Design
80 CRI80 CCT's (≥3000K)
80 Warm White + warmest CCT
90 CRI90 CCT's (2700, …, 4000K)
SW Special White colors
TW Tunable White (2700-6500K)
M Monochromatic Colors
RGB RGB + (RGBW planned)

LINEARLIGHT FLEX



* Depending on positive feasibility results

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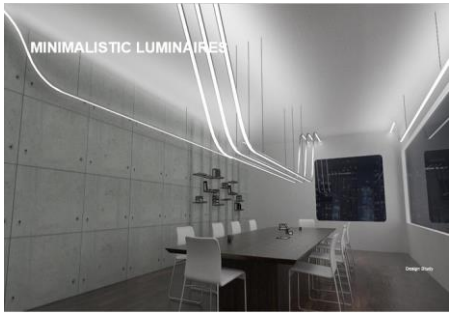
NPD
LINEARLight Flex Power Range

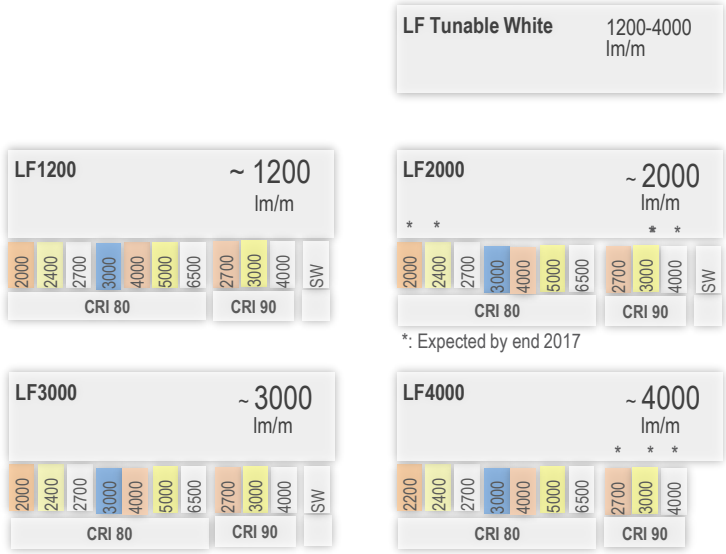
Product Benefits

Applications

- Cove Lighting
- General Lighting
- Flexible Luminaires



Product Technical Description



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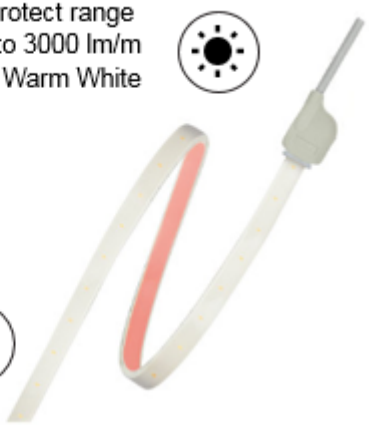
NPD
LINEARLight Flex Power Range Protect

Product Benefits

High Flux levels in Protect range
→ up to 3000 lm/m
→ 800 lm/m Version for Warm White

Warm white in protect
→ down to 2400K

Special Whites upon positive feasibility



Applications

- Cove Lighting
- Ships
- Swimming Pools

Product Technical Description

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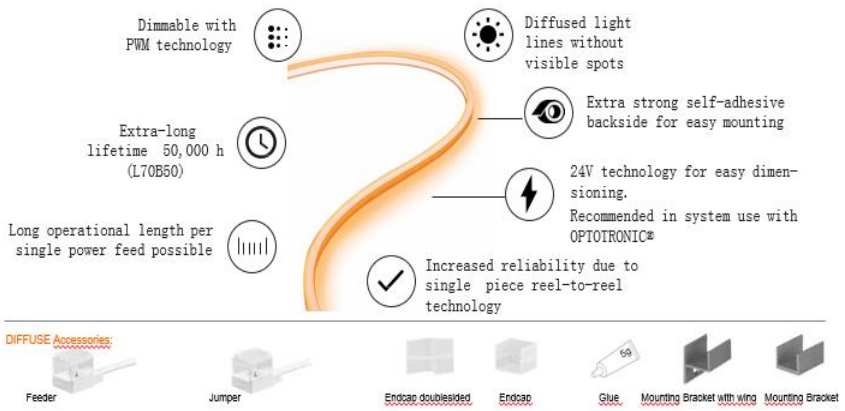
NPD
LINEARLight Flex Diffuse

Product Benefits



Applications

- Decorative Lighting
- Direct Outdoor Application

Product Technical Description

Bending:	TOP & SIDE
Colors:	White (2700K, 3000K, 4000K, 6500K) Red, Green, Blue, Yellow, Orange
Operable length:	6m
Other:	Cuttable, IP67, new slim connecting system

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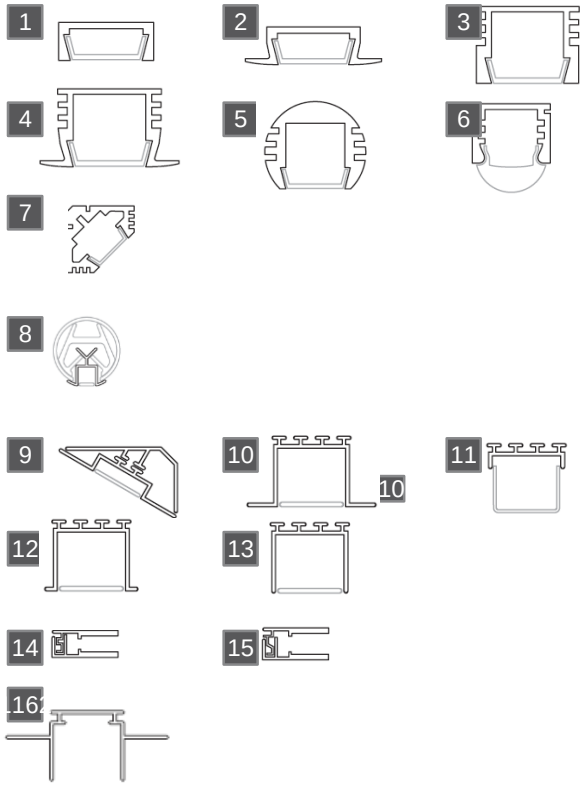
LINEARLIGHT FLEXESSORIES – The New QUICK MOUNTING TRACKS

Overview Tracks

Tracks

Description	Product Name	Ordering code	Pictures
SLIM TRACKS	FX-QMS-G1-TU15H6-300	4052899448865	1
SLIM TRACKS	FX-QMS-G1-TU15H6W3-300	4052899448889	2
SLIM TRACKS	FX-QMS-G1-TU16H12-300	4052899448964	3
SLIM TRACKS	FX-QMS-G1-TU16H12W3-300	4052899448988	4
SLIM TRACKS	FX-QMS-G1-TR19H16-300	4052899449008	5
SLIM TRACKS	FX-QMS-G1-TU16H12LS-300	4052899449046	6
SLIM TRACKS	FX-QMS-G1-T45D19H19-300	4052899448667	7
HANDRAIL TRACK	FX-QMH-G1-TU15H23W4-105	4052899449022	8
WIDE TRACK	FX-QMW-G1-TK30D46H27-300	4052899448827	9
WIDE TRACK	FX-QMW-G1-TU26H25W10-300	4052899448773	10
WIDE TRACK	FX-QMW-G1-TU26H8-300	4052899448643	11
WIDE TRACK	FX-QMW-G1-TU26H25W2-300	4052899448841	12
WIDE TRACK	FX-QMW-G1-TU26H25-300	4052899448803	13
EDGE LIGHTNG TRACK	FX-QME-G1-T6G10H25-300	4052899448711	14
EDGE LIGHTNG TRACK	FX-QME-G1-T810G12H25-300	4052899448759	15
MOUNTING PROFILE SET 10 11 12 13	FX-QMW-G1-P125C30-DIV1-300	4052899449060	16

To be usedwith:



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LINEARLIGHT FLEX – The New Flexessories

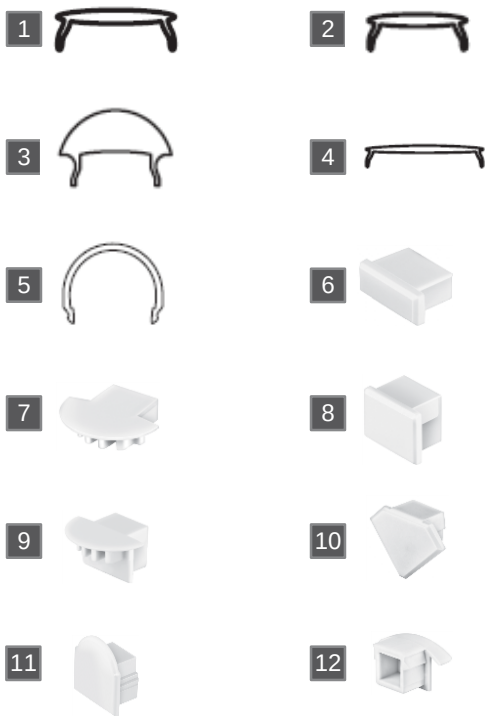
Overview Covers and End Caps

Covers

Description	Product Name	Ordering code	Pictures
Slim cover frosted	FX-QMS-G1-CFDL-300	4052899447059	1
Slim cover frosted matte (also for handrail)	FX-QMS-G1-CFDB-300	4052899446991	2
Slim lens cover transparent	FX-QMS-G1-CLT-300	4052899447783	3
Wide cover flat frosted	FX-QMW-G1-CFDB-300	4052899447806	4
Wide cover round frosted matte	FX-QMW-G1-CRD-300	4052899447035	5

End caps

Description	Product Name	Ordering code	Pictures
End cap grey plain for Slim 1*	FX-QMS-G1-EFGP-TU15H6	4052899449107	6
End cap grey plain for Slim 2*	FX-QMS-G1-EFGP-TU15H6W3	4052899449138	7
End cap grey plain for Slim 3*, 6*	FX-QMS-G1-EFGP-TU16H12LS	4052899449183	8
End cap grey plain for Slim 4*	FX-QMS-G1-EFGP-TU16H12W3	4052899449817	9
End cap grey plain for Slim 7*	FX-QMS-G1-EFGP-T45D19H19	4052899450028	10
End cap round grey plain for Slim 6*	FX-QMS-G1-ELGP-TU16H12LS	4052899449879	11
End cap grey plain for Handrail	FX-QMHR-G1-EFGP-TU15H23W4	4052899449848	12



*numbers of tracks from previous slide as follow: SLIM TRACKS

Matching test to be done in May

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LINEARLIGHT FLEX – The New Flexessories

Overview End Caps, Mounting Brackets and Springs

End caps

Description	Product Name	Ordering code	Pictures
Flat end cap grey plain left side for wide 9*	FX-QMW-G1-EFGP-L-TK30D46H27	4052899450059	13
Flat end cap grey plain right side for wide 9*	FX-QMW-G1-EFGP-R-TK30D46H27	4052899449909	14
Flat end cap grey plain for wide 10*	FX-QMW-G1-EFGP-TU26H25W10	4052899450134	15
Flat end cap grey plain for wide 12*	FX-QMW-G1-EFGP-TU26H25W2	4052899450219	16
Flat end cap grey plain for wide 13*	FX-QMW-G1-EFGP-TU26H25	4052899450240	17
Round end cap grey plain for wide 11*	FX-QMW-G1-ERGP-TU26H8	4052899450271	18
End cap grey for edge lighting 14*	FX-QMED-G1-EXGP-T6G10H25	4052899450301	19
End cap grey for edge lighting 15*	FX-QMED-G1-EXGP-T810G12H25	4052899450080	20
End cap for mouting profile 16*	FX-QMW-G1-EFGP-PC30	4052899450165	21
Clip for mouting profile 16*	FX-QMW-G1-XCLPL1-DIV1	4052899446731	22

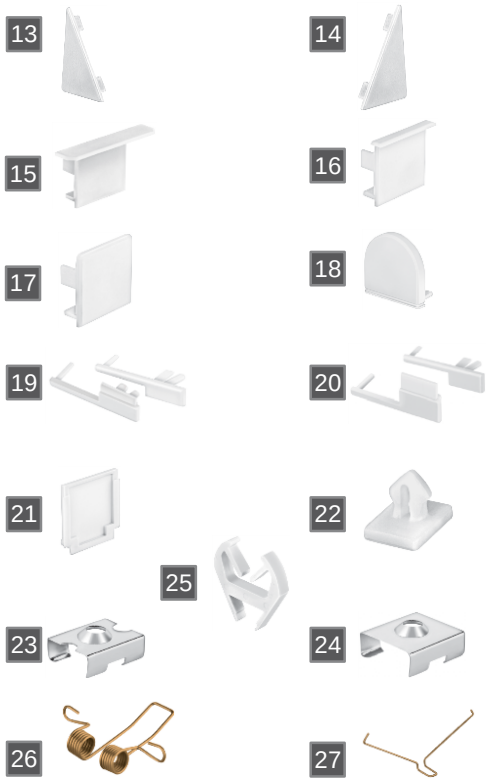
Mouting brackets

Description	Product Name	Ordering code	Pictures
Mouting bracket for slim 1, 3, 5, 6*	FX-QMS-G1-BMZI-DIV1	4052899446861	23
Mouting bracket for slim 7*	FX-QMS-G1-BMZI-T45D19H19	4052899446960	24
Mouting bracket for handrail	FX-QMHR-G1-BUHR42PL-TU15H23W4	4052899446939	25

Springs

Description	Product Name	Ordering code	Pictures
Mouting spring metal for wide 10*	FX-QMW-G1-SRME-DIV1	4052899446786	26
Mouting spring metal for wide 11, 13*	FX-QMW-G1-SRME-DIV2	4052899446830	27

*numbers of tracks from previous slide as follow: FSLIM TRACKS



Matching test to be done in May

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LECV Flex

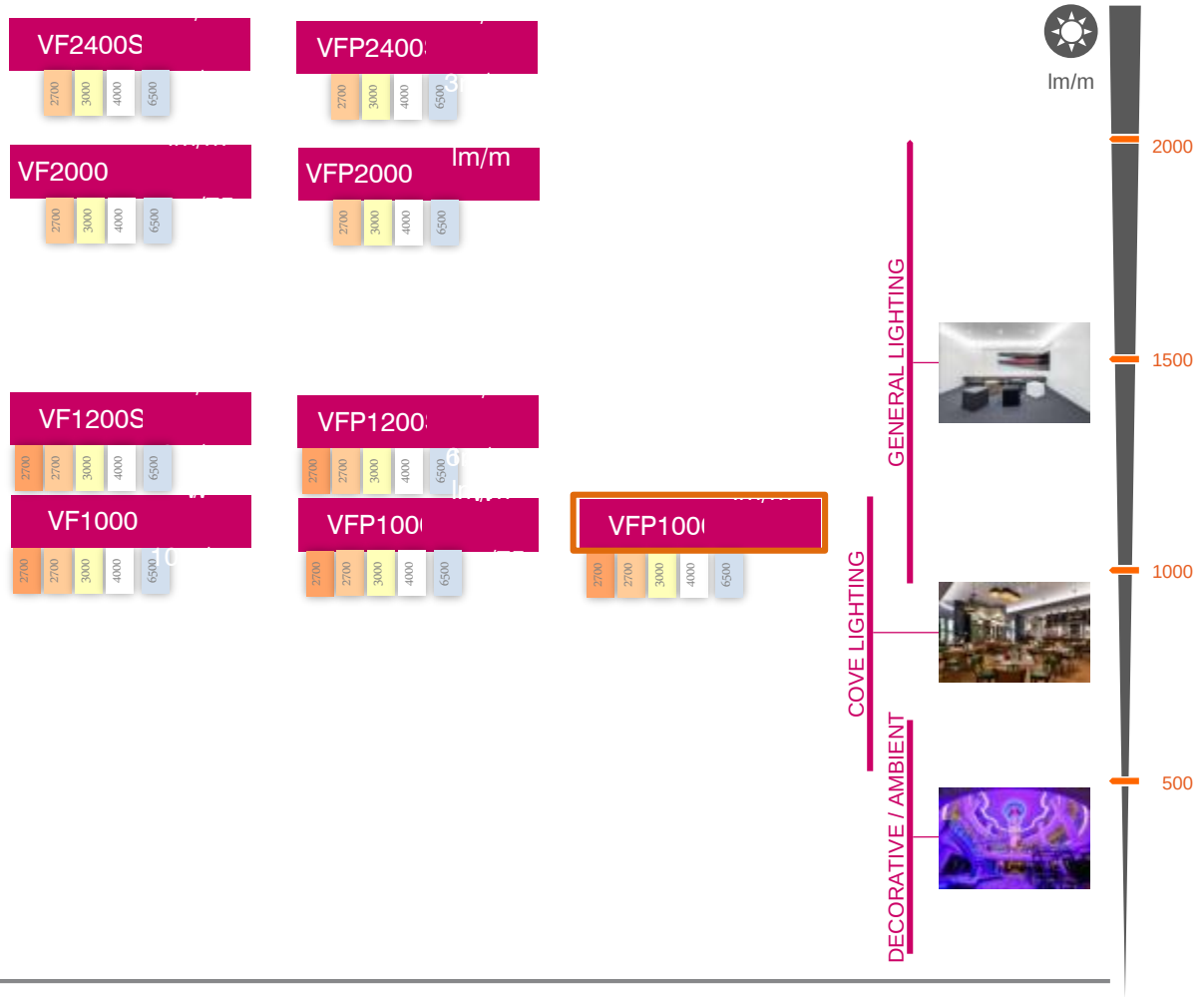
--- Value Flex Portfolio Update

VALUE Flex®

Key Features/Improvements:

- **Better reliability with improved layout design and extrusion production**
- **Much higher efficacy for spec in up to 130lm/W on G3**
- **ShortPtich version for seamless output even under slim diffuser**
- **Better flexibility to achieve different lumen levels with small dimmer**

- **VFP1000 Plus with pre-molded connector could be up to IP68 protection for underwater application (no re-assembling on customer side)**



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Value Flex G3 Plus

Product Features

A robust Flex solution for true outdoor application!

Product description

- Beam Angle: 120˚
- Lumen output: 1000 lm/m
- Working voltage: 24 VDC
- Power: 9.6 W/m
- Length per reel: 10,000 mm
- IP65 protect
- CCT: 2400k,2700k, 3000k, 4000k,6500K

Product benefits

- **Good reliability with robust housing and design**
- **Single IC per CCT**
- **SDCM<4**
- UV proof
- Flam proof
- 3 years OSRAM warranty

Applications

- Cove Lighting
- Shelf Lighting
- Under water solution as customization
- Signage

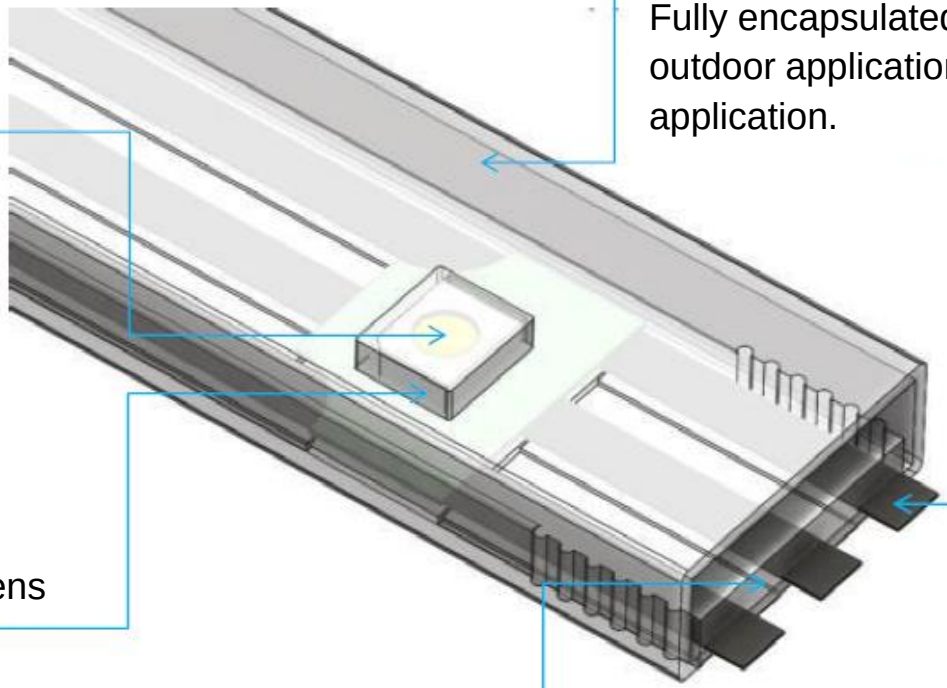
Value Flex G3 Plus

Molding + Extrusion + Braided Wire Technology

Waterproof & Weatherproof Jacket

Fully encapsulated with TPU for true outdoor application, even underwater application.

LED on PCB to prevent twisting/bending



Braided Wire

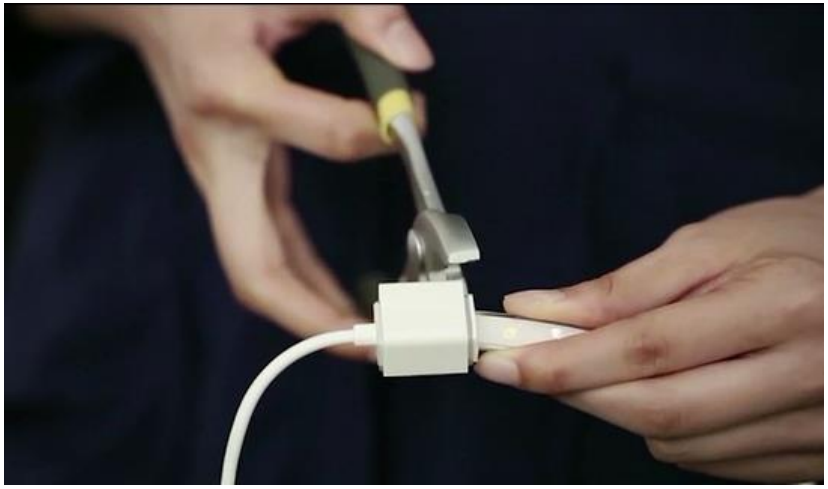
Cable technology offers much more robust structure with lower electronic resistance

Optical Lens

Molding with heat conductive plastic

Unique Product Design

Easy connection



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Unique Product Design

Easy connection

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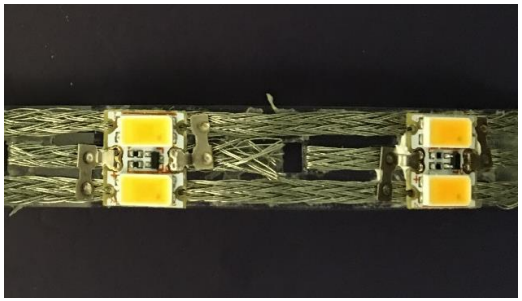
Benchmark

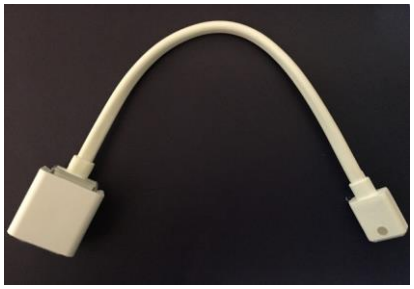
VF G3 Plus vs. Competitor

VF G3 Plus

- Braided wire for lower voltage drop

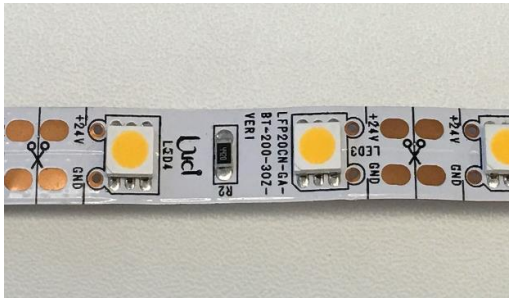


- Packing:10~12m/reel
- TPU + thermal plastic molding + braided wire
- Punching through pin connector with locking system

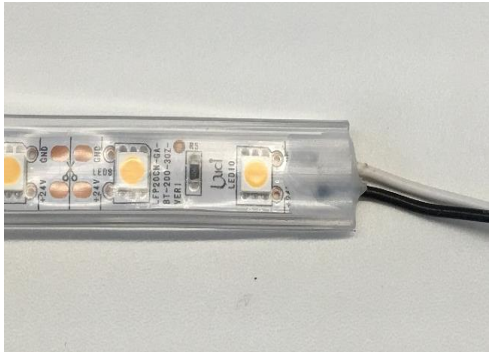


Competitor

- Non constant current by resistor



- Packing: 4.5~5m/reel
- **Silicon tube + FPCB + enhanced plate**



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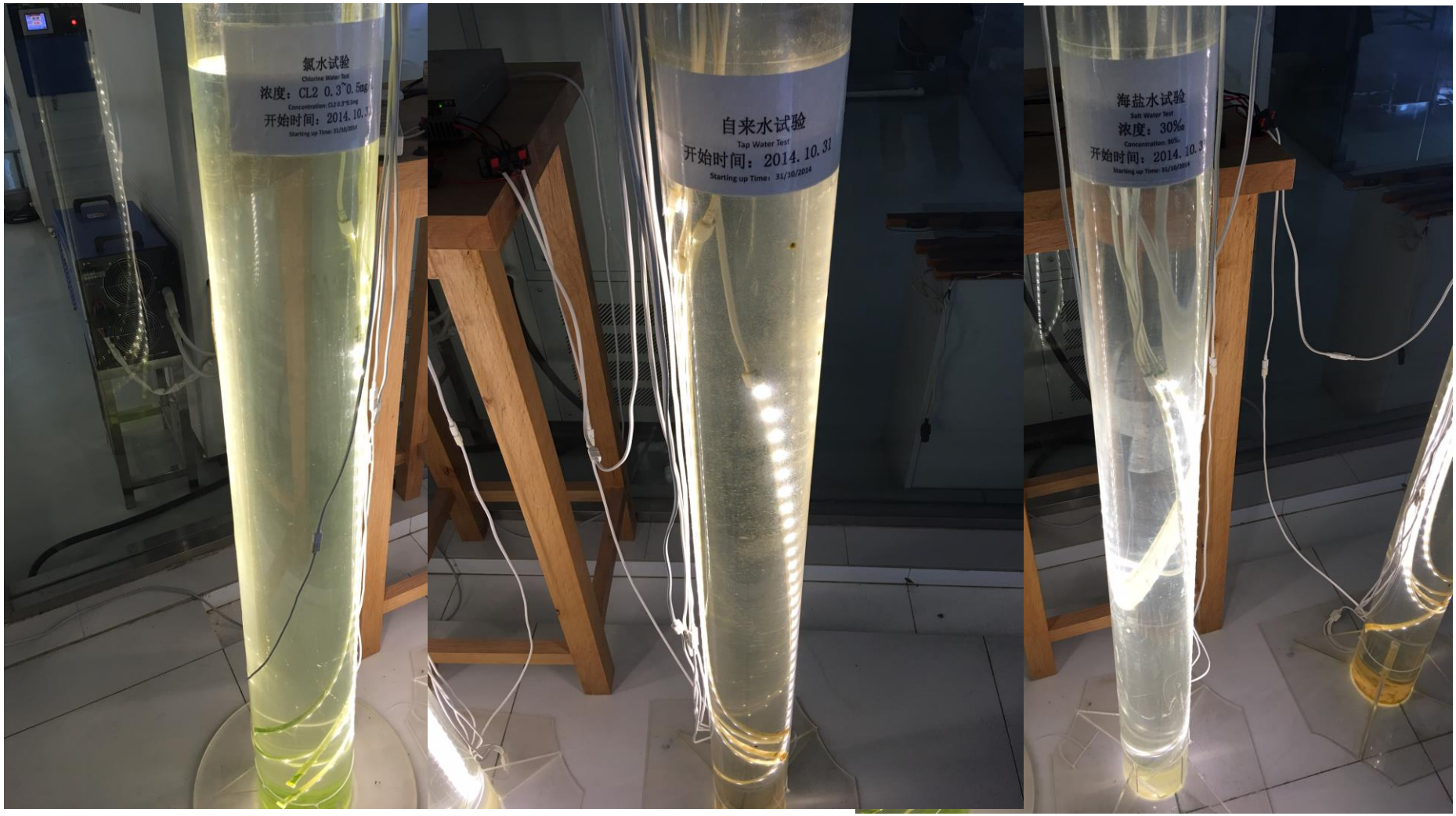
Benchmark

IP68 Test



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Customer Service

Customization

- IP68 for under water application
- Pre-molded connector
- Cut to size customization service

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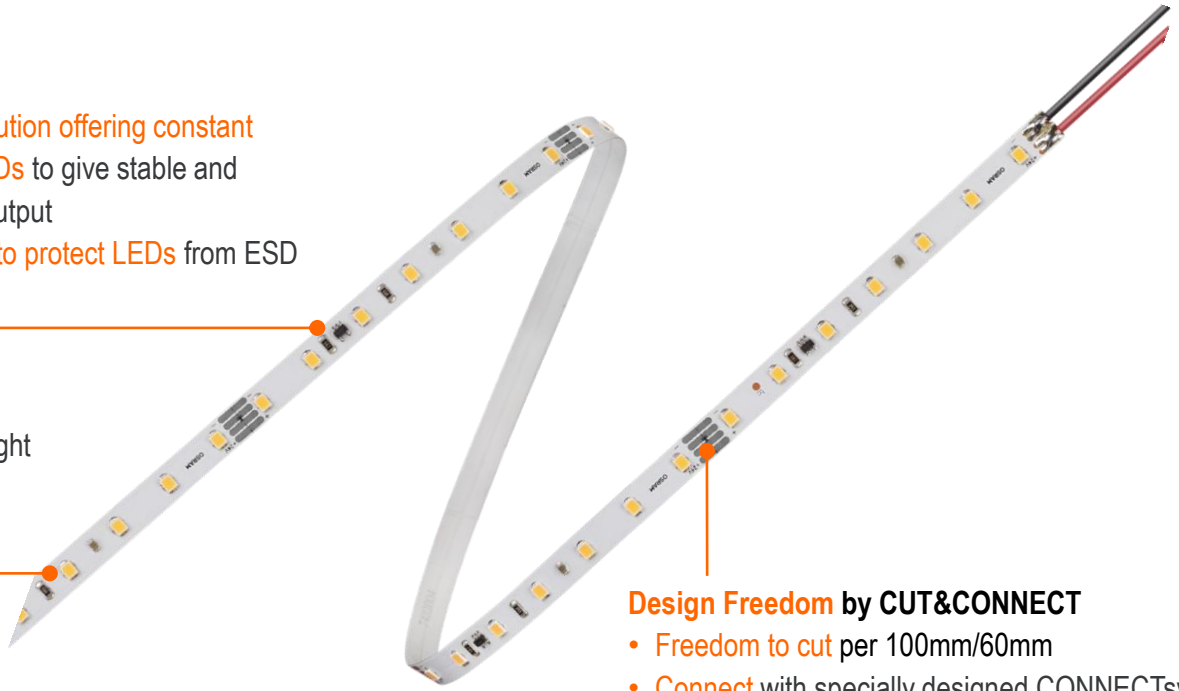
Value Flex G3
--- Product View

QUALITY DESIGN
- High precise IC solution offering constant current through LEDs to give stable and consistent lumen output
- Conformal coating to protect LEDs from ESD damange

PROFESSIONAL LIGHT
- Single narrow white binning for homogenous light color appearance
- High efficiency & high flux for green light

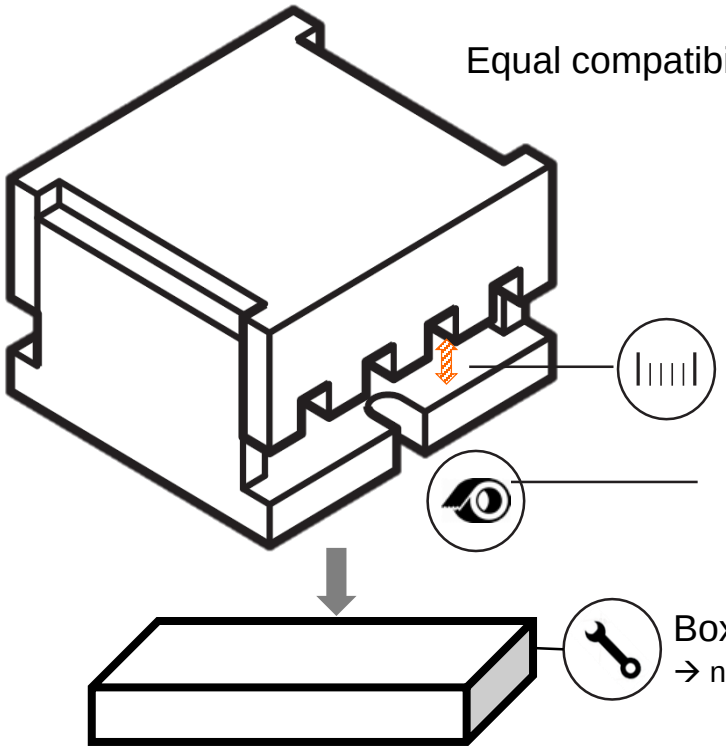


High PROTECTION
- High performance silicone for durable protection
- IP66 protection against dust and water
- UV protection for outdoor use
- Fantastic view with bicolourable silicon housing

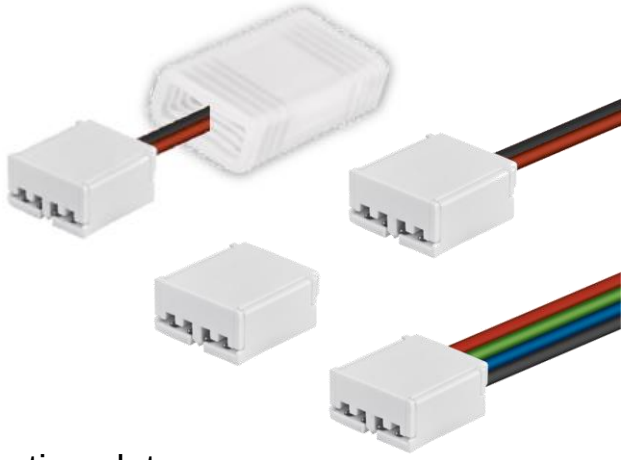
Design Freedom by CUT&CONNECT
- Freedom to cut per 100mm/60mm
- Connect with specially designed CONNECTsystems without big effort
- Easy power supply with 24V technology and matching OPTOTRONIC 24V system

Value Flex G3

--- Improved Connector Solution for IP20 and IP54



Equal compatibility with modules

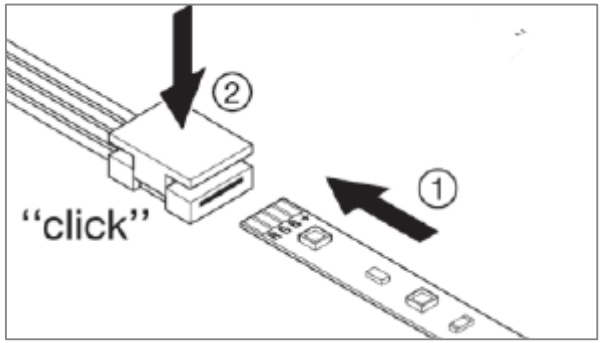


Doubled the size of insertion slot

Extra strong self-adhesive backside for easy mounting

Boxes instead of bags

→ no more closed connectors at deliveries



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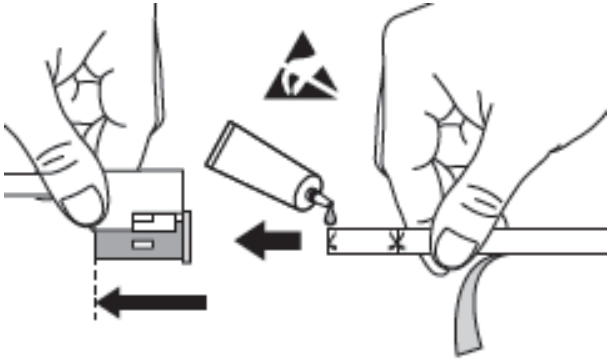
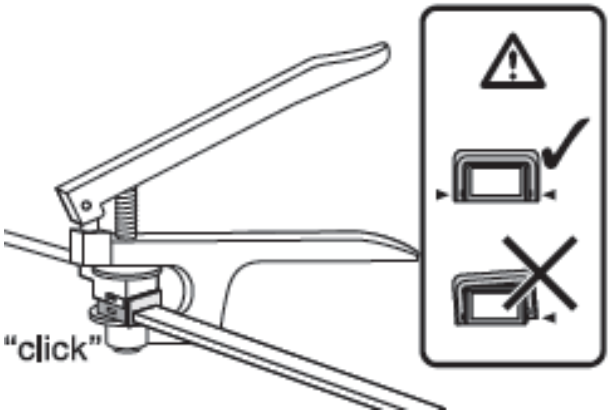
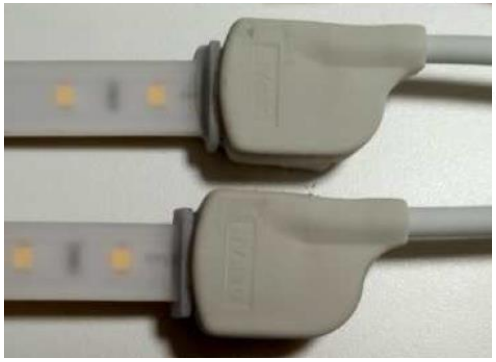
Value Flex G3

--- Improvement with IP66 Connectors Available







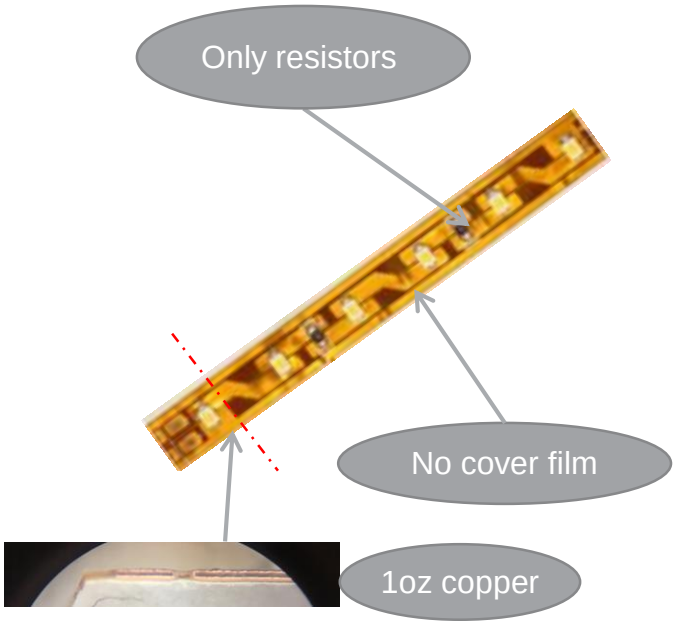
Value Flex G3 could share IP67 connectors same as LINEARLight Flex to achieve IP66 protection after re-assembling.

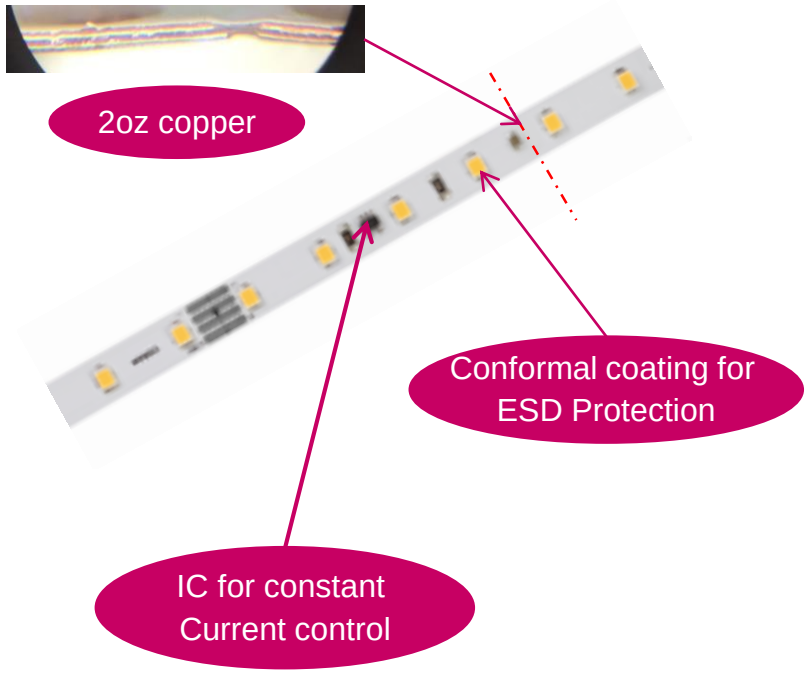
Note: Glue is needed at cut points for Value Flex G3.

Benchmark

--- Precise Current Control and Thicker PCB Material

Other Brands only with Resistors	Value Flex G3





Disadvantages

- Brightness vary with working voltage change
- High risk to be damaged by ESD or wrong connection

Advantages

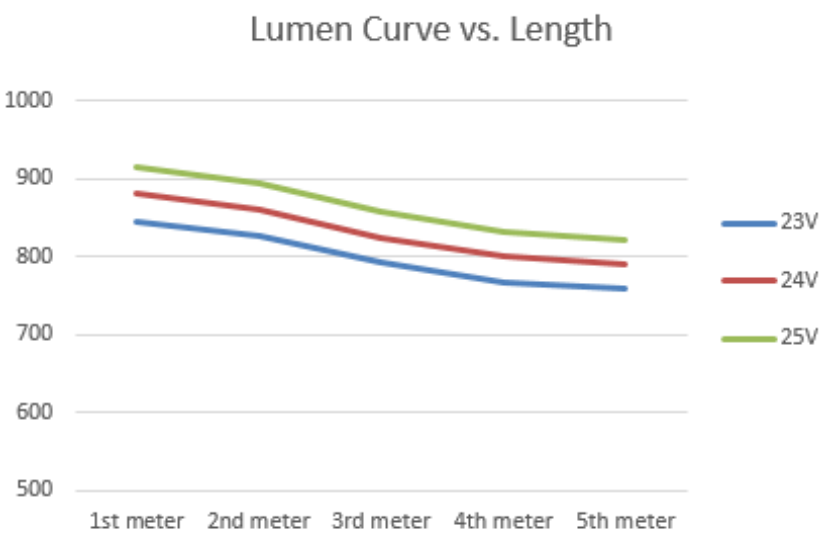
- Stable and consistent brightness
- Avoid being damaged by ESD or anti-polarity

OSRAM

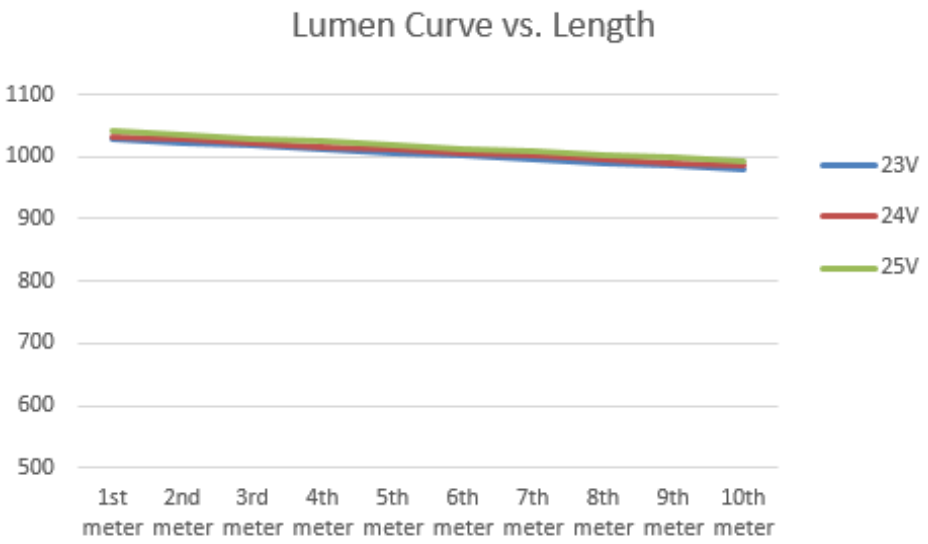
Benchmark

--- Consistent Flux with Constant Current IC Solution

Other Brands only with Resistors



Value Flex G3



Disadvantages

- Lumen output decrease significantly along the reel
- Lumen output vibrate with input voltage changing

Advantages

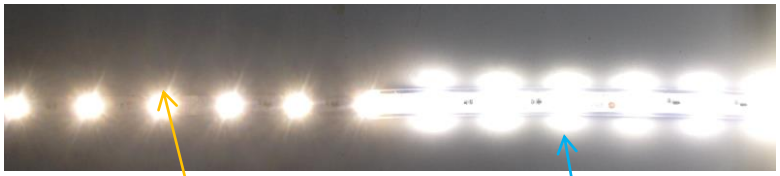
- Consistent brightness in whole reel
- Stable lumen output even input voltage changes

OSRAM

Benchmark

--- No Color shift for IP version

Other Brands with Silicon/Epoxy Potting Solution	Value Flex IP66 G3



Original LED CCT is 2700k

Shift to 3300k after silicon potting

Same CCT on 2700k even after IP66 protection

Disadvantages

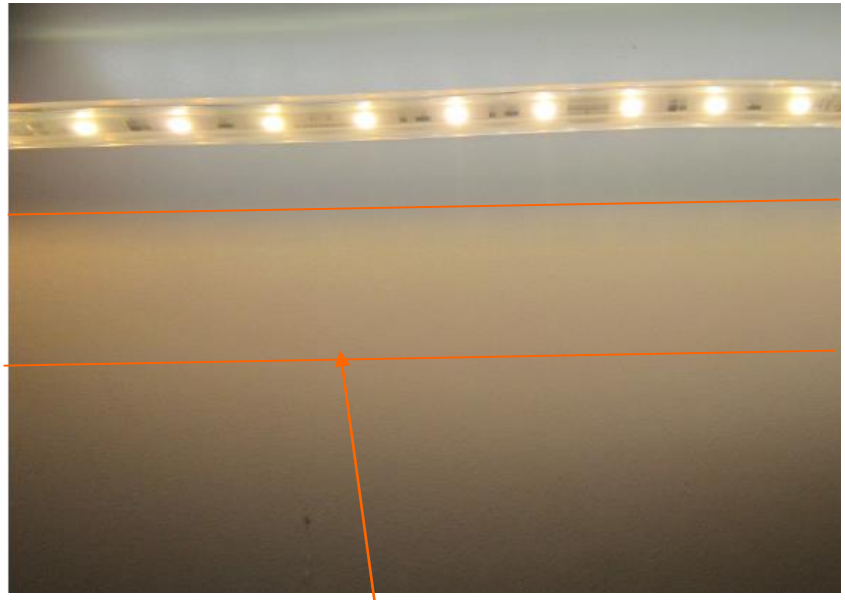
- Final CCT out of control, obvious color deviation
- Warm color unavailable

Advantages

- Final CCT of finished goods under control
- Full range of CCT, 2700k/3000k/4000k/6500k

Benchmark

--- Optical Performance

Other Brands with Silicon/Epoxy Potting Solution	Value Flex IP66 G3
	
Disadvantage ➢ Obvious “Yellow Line” ➢ Poor visual performance	**Advantage** ➢ Smooth light transition, perfect light effect

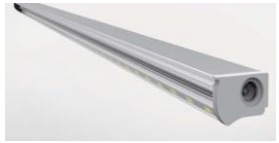
OSRAM

BU DS LECV Rigid

--- Portfolio Segmentation

To be launched at end of 2017

LR Freezer



M2

- 5 years warranty
- CRI>80 & CRI>90
- Asymmetric Optical Design
- One solution to meet vertical and horizontal application
- Embedded constant current IC
- IP65 with conformal coating
- CE

LR Slim Diffuse

M3

- 3 years warranty
- CRI>80
- Seamless light output but no hot dots
- Ultra slim size for indirect shelf lighting
- Embedded constant current IC
- Plug and play with Pre-mounted connectors
- Easy installation and maintenance with Magnet and clips
- CE

Shelf Lighting

Freezer Light

OSRAM

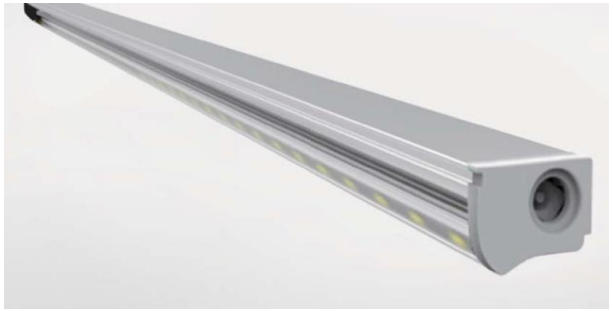
LINEARLight Rigid Freezer

Product Features

A slim solution to meet vertical and horizontal freezer as edge lighting!

Product description

- Beam Angle: 25˚
- Lumen output: 1100 lm/m
- Working voltage: 24 VDC
- Power: 10 W/m
- Length available: 600mm, 1200mm, 1700mm
- IP65 protect with conformal coating
- CCT: 4000k,6500K, 076



Product benefits

- **Asymmetric optical to direct the light to required areas for good uniformity**
- **High reliability with additional conformal coating from moisture damage**
- **Kinds of accessories for easy installation and maintenance**
- **SDCM<3**

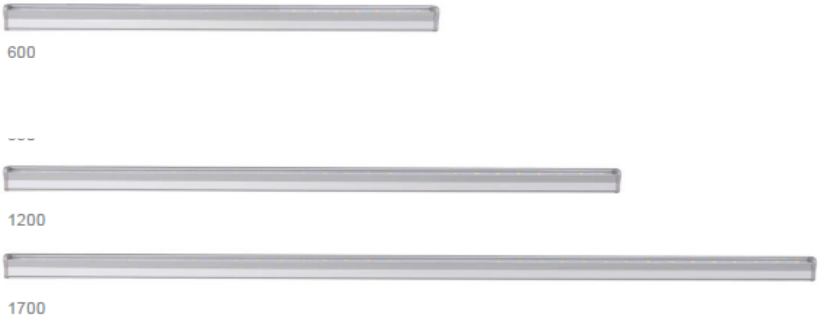
Applications

- Vertical Freezer
- Horizontal Cooler

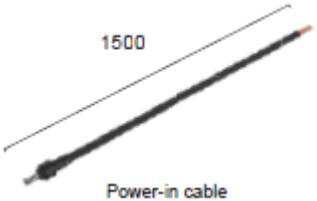
LINEARLight Rigid Freezer

--- Product and Accessories

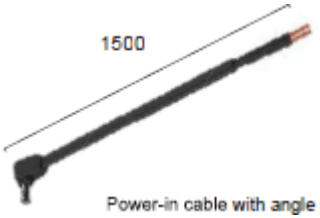
LR Freezer Modules



Connector System



Power-in cable



Power-in cable with angle plug

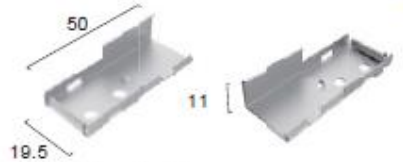
Extension cable

Interlinkable connector

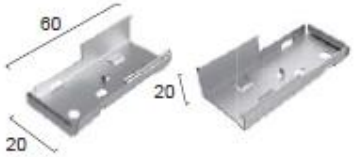
Clip System

Mounting clip centre
x1

Mounting clip side
x1



Mounting clip side
x1 set



Mounting clip side
x1 set

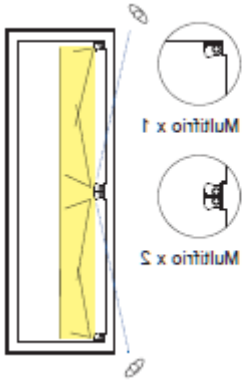
OSRAM

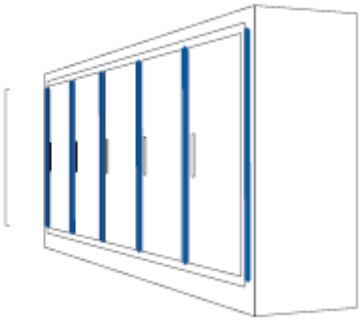
LINEARLight Freezer

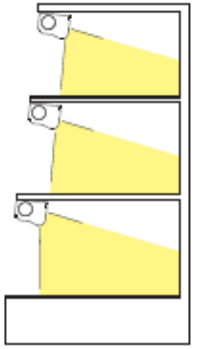
--- Application

Vertical Application

Horizontal Application







OSRAM

LINEARLight Freezer

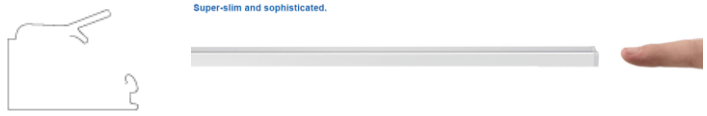
--- Benchmark for Vertical Application

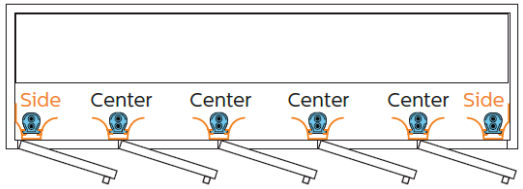
OSRAM LR Freezer

- **Higher brightness can be achieved**
- **More convenient for stock up**

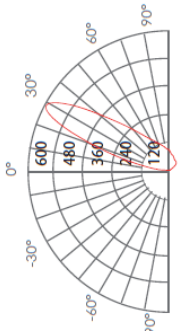
Competitor P

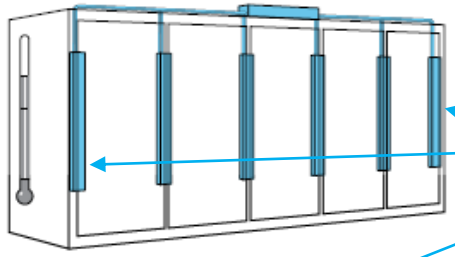
- **Additional track as heatsink**
- **lower efficiency on side**

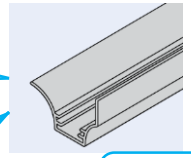




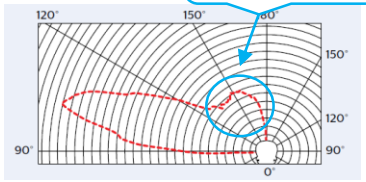
Vertical application

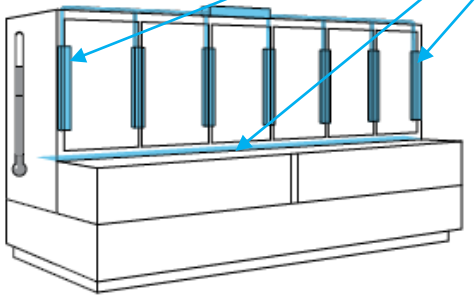


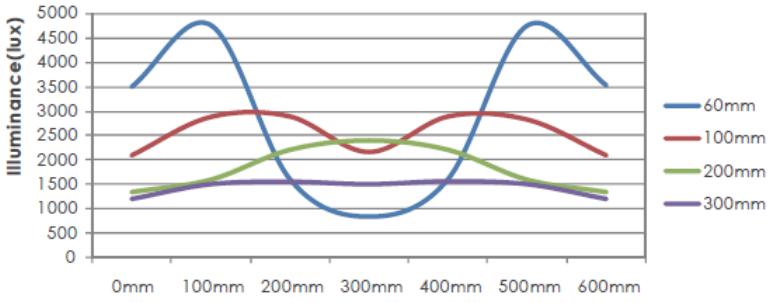




Reflected light is wasted







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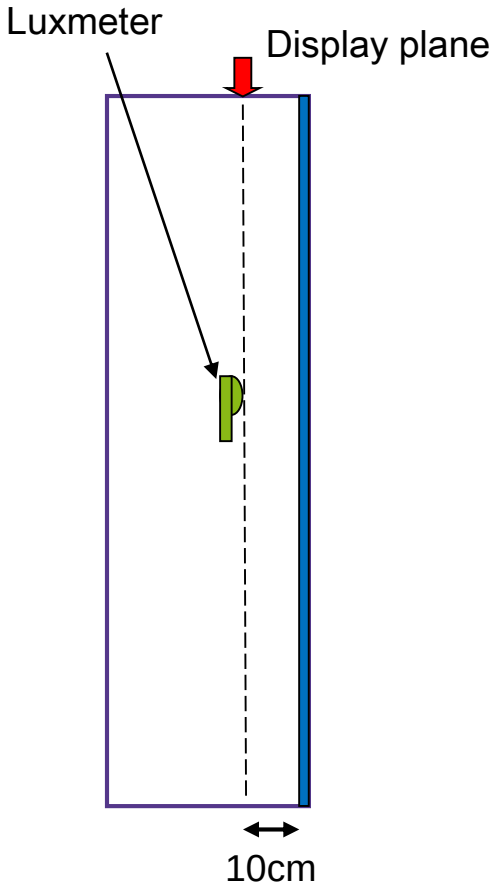
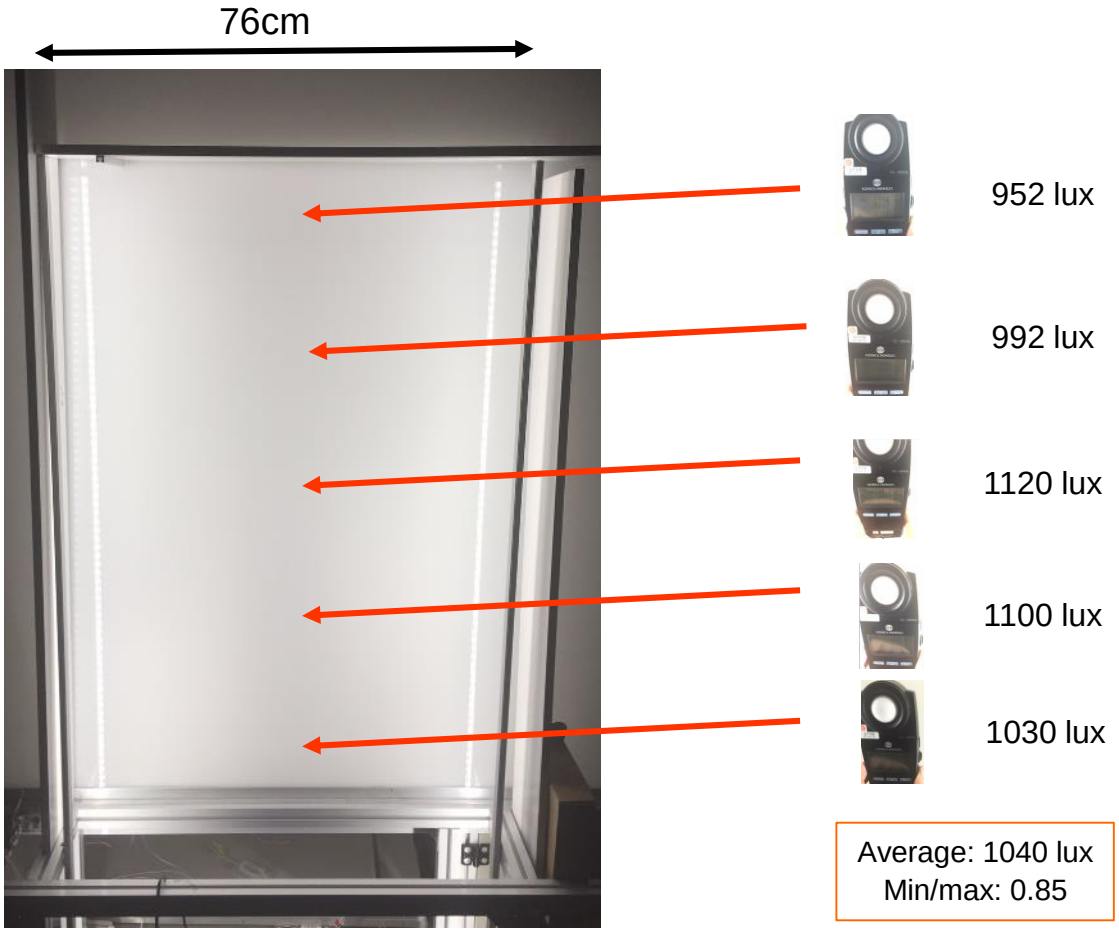
LINEARLight Freezer

--- Measurement Data for Vertical Application





Illuminance levels are measured at the center of the case , with the lux sensor placed horizontally, facing outwards.

- No contribution from ambient light.
- Illuminance value indicated are based on a 840,1700mm module.

OSRAM

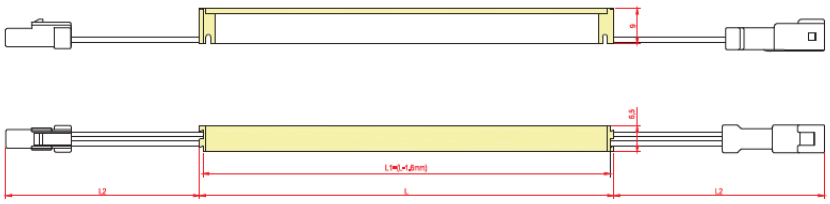
LINEARLight Rigid Slim Diffuse

--- Product and Accessories

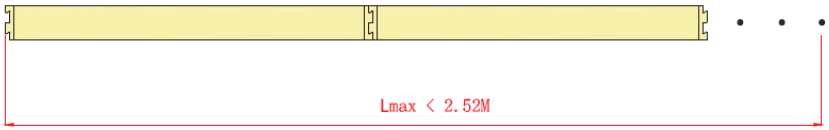
To be launched at end of 2017

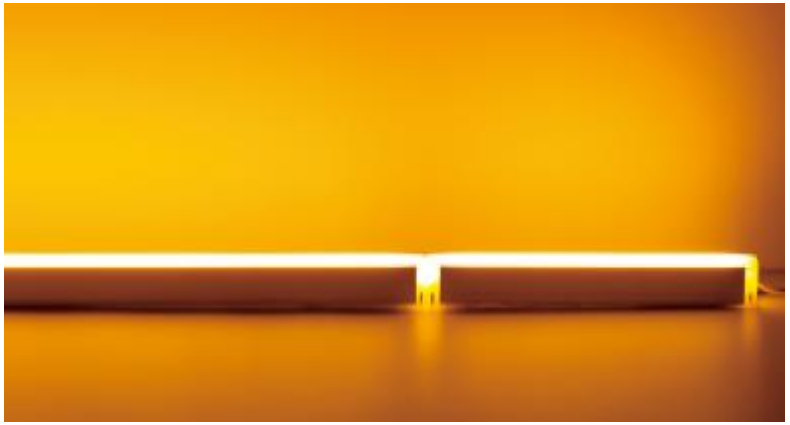
LR Slim Modules

Structure Dimension



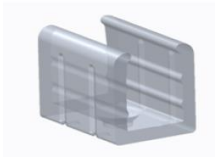
Seamless Connection





Connector System

Clip System



OSRAM

LINEARLight Rigid Slim Diffuse

Product Features

An ultra slim and seamless light solution for indirect shelf lighting!

Product description

- Beam Angle: 120˚
- Lumen output: 800 lm/m
- Working voltage: 24 VDC
- Power: 15 W/m
- Length available: 600mm, 1200mm
- IP20 protect
- CCT: 2700k, 3000k, 4000k,6500K

Product benefits

- **Seamless output, no hot dots**
- **Easy connection and maintenance with pre-mounted connectors**
- **Single IC per CCT**
- **SDCM<4**
- Flam proof

Applications

- Cove Lighting
- Shelf Lighting

OSRAM

LINEARLight Rigid Slim Diffuse

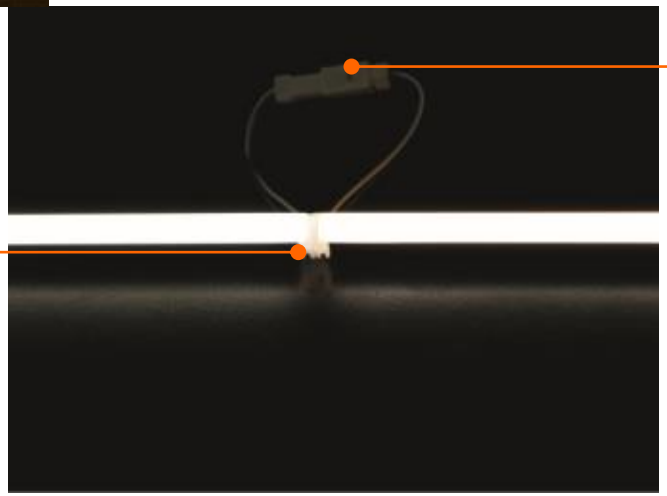
Product Features

Quality Design

- Ultra slim for embedded shelf lighting
- IC solution for stable lumen output and high efficiency

Flexibility

- Optional clips and magnet for easy installation
- Pre-mounted reliable connector for quick maintenance



Professional Light

- Seamless output with diffused cover and high intensity of LED
- No shadow even at connection joints thanks to transparent end cap

Thanks!

Spot & Downlight Light Engines

New Product Launch – COIN / CORE

Jonathan Ho

OSRAM

Light Engines – Spot & Downlight
Product Portfolio

COIN

COIN DC COB G1 New!!!

COIN DC G2

COIN AC G1

CORE

CORE Pro / Mini New!!!

CORE Z6 / Z6 Mini

CORE Basic New!!!

CUBE

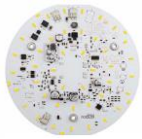
CUBE DC G3

CUBE AC DALI

CUBE AC G3

FLAT

PrevaLED FLAT AC



Basic FLAT AC G2 New!!!

Basic FLAT AC G1

OSRAM

PrevaLED® COIN DC COB G1

COIN50 & COIN111 – New Product Launch

COIN 111

COIN 50

Retail Shops

Hypermarkets

Shopping Mall

Office

Residential

OSRAM

Coin Family

Positioning and Target Segment

DIM TO WARM

Performance DC

COIN111 DC COB G1	COIN50 DC COB G1	COIN111 DC G2	COIN50 DC G2	COIN D2W DC
New!!!	New!!!			

Efficacy >100lm/W
Lifetime L80B50 > 50khrs
Warranty 5 years

Value AC

COIN111 AC G2	COIN50 AC G2	COIN111 AC G1	COIN50 AC G1	COIN D2W AC

Efficacy >90lm/W
Lifetime L70B50 > 35khrs
Warranty 3 years

Down light application
- ✓Office
- ✓Hospitality
- ✓Corridor

Spotlight application
- ✓Shop
- ✓Office
- ✓Hospitality
- ✓Museum

New Product | Planning | Existing

OSRAM

PrevaLED® COIN DC COB G1

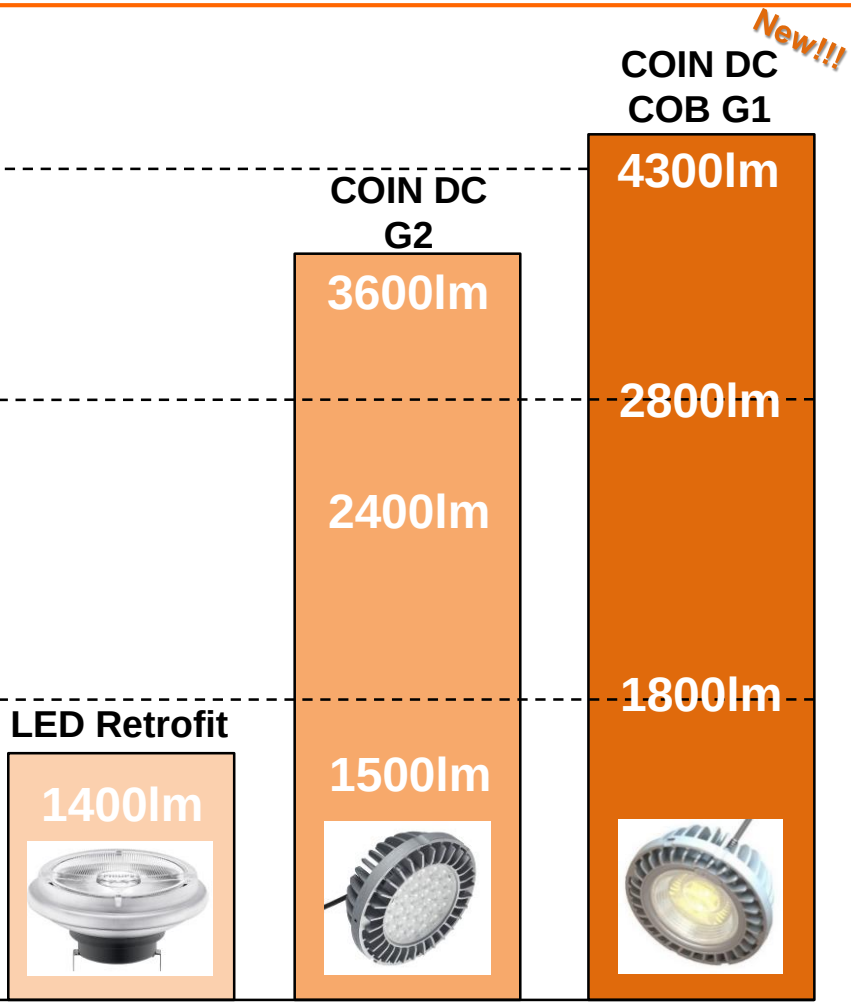
COIN111 COB G1 – Truly Replacement of CDM-T 70W lamp

HID (CDM-T) 70W
Design Mean Lumen: 5300lm
After reflector (80%): **4250lm**
After reflector (70%): **3700lm**

HID (CDM-R111)
70W Lumen: **2800lm**
35W Lumen: 1300lm

HID (CDM-T) 35W
Design Mean Lumen: 2250lm
After reflector (80%): **1800lm**

Halogen AR111
100W
1200lm



OSRAM

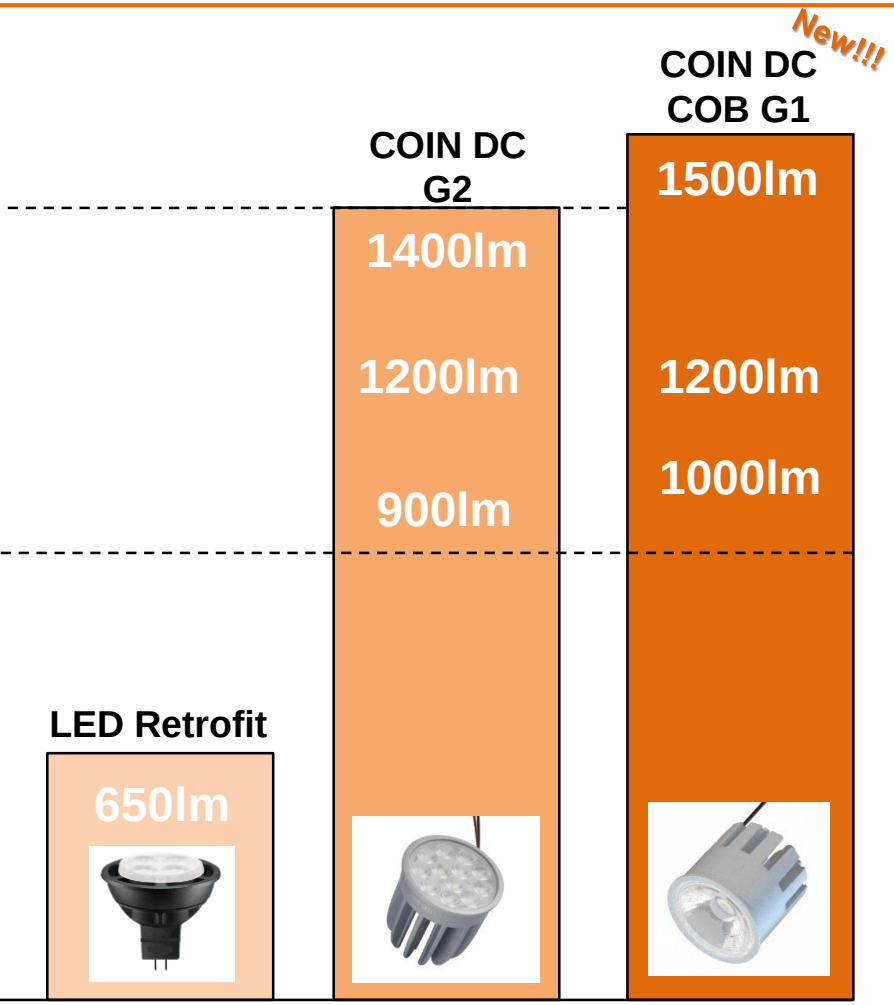
PrevaLED® COIN DC COB G1

COIN50 COB G1 – Truly Replacement of CDM 35W lamp

HID mini (CDM-RM mini) 35W
Design Mean Lumen: **1450lm**

HID mini (CDM-Rm mini) 20W
Design Mean Lumen: **850lm**

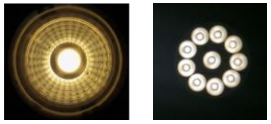
Halogen MR16 50W
680lm

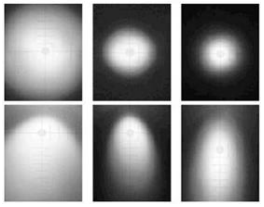


OSRAM

PrevaLED® COIN DC COB G1

Value Proposition





I. Single Light Source without Multi-shadow

II. High Performance & Quality of Light

COIN
DC COB G1

III. Full Range of Beam Angles and Flux Output

IV. Comply with Conventional Lamp Form Factor

OSRAM

PrevaLED® COIN DC COB G1

I. Single Light Source without Multi-shadow

- **Uniform Light Emitting Surface**
  - ✓ Adopted metal-substrate COB LED solution
  - ✓ Polycarbonate lens with built-in glare control
- **Appearance similar to conventional lamps**
  - ✓ Halogen and HID lamp
  - ✓ Precise optical beam pattern control

Single Optic

Multi Optic

Concave Surface
Effective Glare Control

Planar Surface
without proper Glare Control

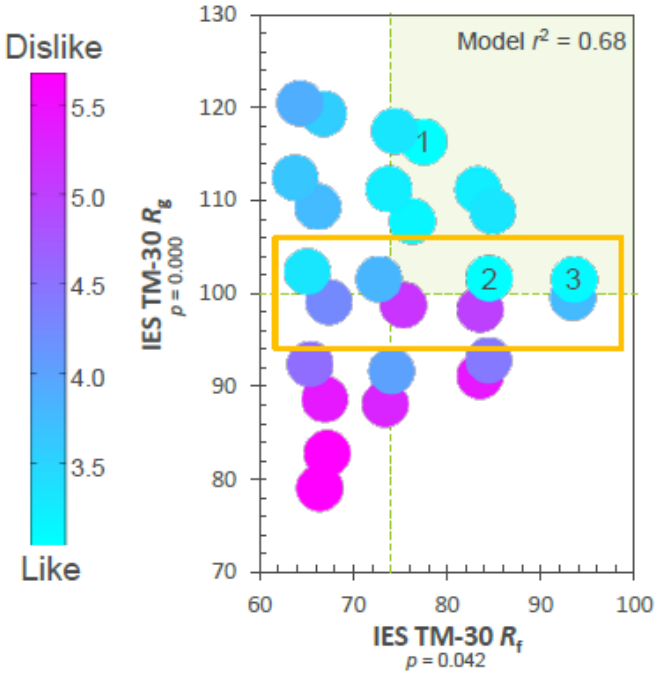
- Concave surface achieve better control of glare than original flat lens panel used in COIN DC G2
- Cut off light at larger angle (> ± 75°), obvious effect at low-ceiling installation

PrevaLED® COIN DC COB G1

II. High Color Rendering Performance

- **Comply with IES TM30-15**
  - ✓ New and more accurate definition beyond CRI
  - ✓ Color Fidelity (Rf, 0-100)
  - ✓ Color Gamut (Rg, 60-140)
- **High Fidelity of COIN CRI90 series**
  - ✓ **Rf 90, Rg 100**
  - ✓ CRI >90, R9 for deep red >50

TM30 (“99” different colors)



CRI (8 different colors)

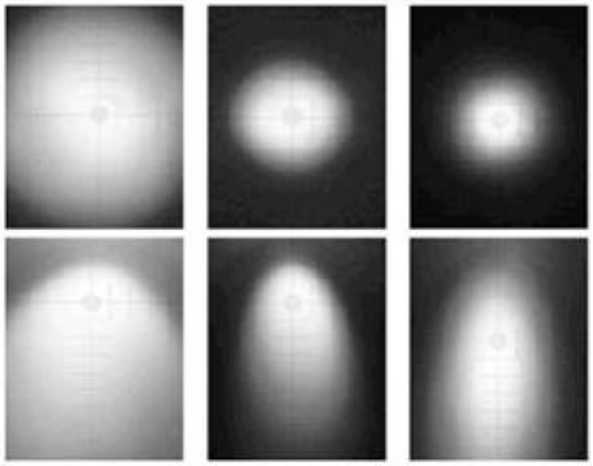
Conventional CRI only represent averaged color-rendering performance of eight different colors; in comparison, TM-30 is based on 99 colors chosen from various objects around our daily lives.

OSRAM

PrevaLED® COIN DC COB G1

III. Full Range of Beam Angles and Flux Output

- **Flexible Beam Angle Options**
  - ✓ Narrow Beam (15 – 20°)
  - ✓ Medium Beam (24 – 30°)
  - ✓ Wide Beam (40 – 60°)
- **Wide Range of Flux Output**
  - ✓ COIN50 980-1500lm
  - ✓ COIN111 1650-4870lm



Provide the highest lighting design freedom

	COIN50 DC COB G1			COIN111 DC COB G1		
FWHM	900lm	1200lm	1400lm	1800lm	2800lm	4300lm
15°	•			•	•	
24°	•	•	•	•	•	•
40°	•	•	•	•	•	•
60°						•

900lm and 1800lm are **CRI90** models, others are **CRI80**. Special request of CRI90 on other model can be supported, flux output will decrease by 10-15%.

OSRAM

PrevaLED® COIN DC COB G1

IV. Comply with Conventional Lamp Form Factor

▪ COIN 50 DC COB G1

Product Range	COIN50 COB G1	COIN 50 G2	Halogen MR16 (GU5.3)	CDM MR16 (GX10)
Type	LED Module	LED Module	Conventional	Conventional
Photo				
Dimension (mm)	D50 x H50	D50 x H50	D51 x H50.5	D51 x H62

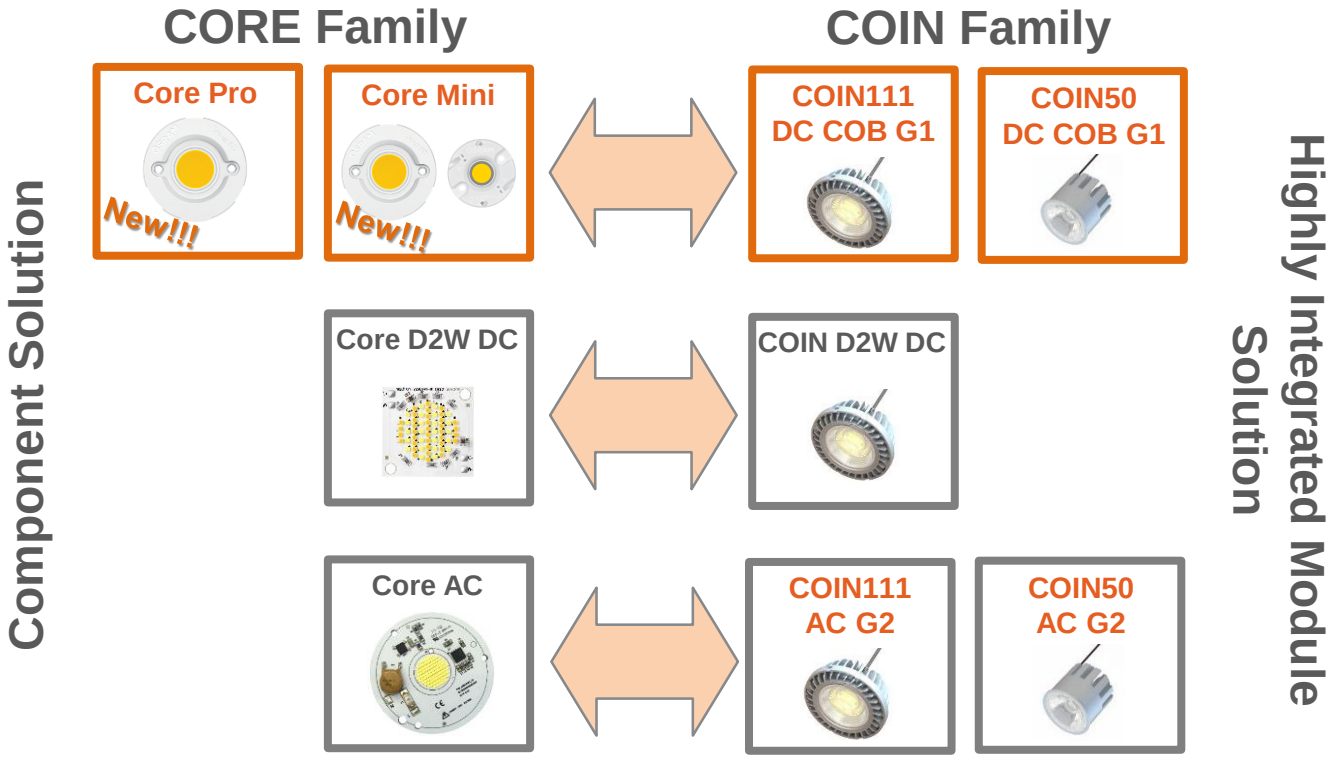
▪ COIN 111 DC COB G1

Product Range	COIN111 COB G1	COIN111 G2	Halogen AR111 (G53)	CDM-R111 (GX8.5)
Type	LED Module	LED Module	Conventional	Conventional
Photo				
Dimension (mm)	D111.7x H52	D111.7x H46	D111 x H67	D110 x H95

Form factor highly compatible with halogen and CDM lamps, CN111 is even more compact than conventional lamps in terms of height (52mm vs. 67-95mm).

PrevaLED® CORE and COIN

Component and LED Module solutions



OSRAM

Core Family

Positioning and Target Segment

DIM TO WARM

Performance

Core Pro New!!!

Core Mini New!!!

Core Z6

Core Z6 Mini

Core D2W DC

Efficacy >145lm/W
Lifetime L80B50 > 50khrs
Solderless holder available
Warranty 5 years

Value

Core Value G2

Kit Value Core G2

Core D2W AC

Efficacy >125lm/W
Lifetime L70B50 > 50khrs
Mechanical holder available
Warranty 5 years

Basic

Core Basic New!!!

Kit Basic Core

Efficacy >100lm/W
Lifetime L70B50 > 30khrs
Mechanical holder available
Warranty 3 years

Down light application
- ✓Office
- ✓Hospitality
- ✓Corridor

Spotlight application
- ✓Shop
- ✓Office
- ✓Hospitality
- ✓Museum

New Product | Planning | Existing

OSRAM

PrevaLED® CORE Pro / Mini

Best Performance, Quality of Light, Compact Module Size

Mini series for Compact fixture design!

Luminous Flux Range

CORE Z5

5000lm
3000lm
2000lm

D50
LES19

1100lm

D50
LES 9

CORE Z6

5000lm
3000lm
2000lm

D50
LES19

CORE Z6 Mini

3000lm
2000lm

D35
LES13

CORE Pro New!!!

5000lm
4000lm
3000lm

D50
LES19

CORE Mini New!!!

4000lm
3000lm
2000lm

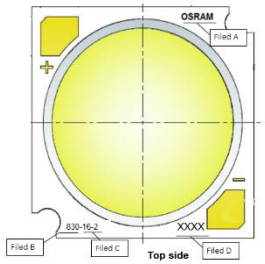
D35
LES 14.5
LES 9.8

Efficacy	90-120 lm/W	100-140 lm/W	120-160 lm/W
Flux Density (lm/mm2)	7-18	7-18 (Z6) / 15-23 (Z6 Mini)	11-19 (Pro) / 16-25 (Mini)
Holder Size	D 50mm	D 50mm (Z6) / 35mm (Z6Mini)	D 50mm (Pro) / 35mm (Mini)

PrevaLED® CORE Pro / Mini

Value Proposition

IES TM30-15



I. High Performance & Quality of Light

II. Flexible Holder Options for Assembly

Core
Pro & Mini

III. Single LES with Wide Flux Range to Simplify Optics

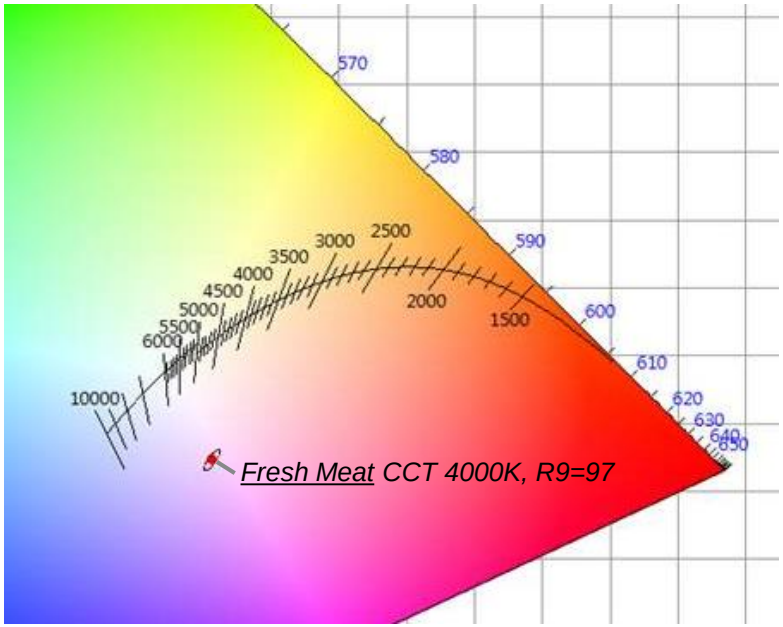
IV. Standard Package Design to Leverage Ecosystem

OSRAM

PrevaLED® Core Pro / Mini

I. High Performance and Quality of Light

- **Deliver High Efficacy**
  - ✓ Min CRI 80 → 145-160lm/W
  - ✓ Min CRI 90 (TM-30) → 120-135lm/W
- **Consistent Performance**
  - ✓ MacAdam Ellipse < 3SDCM
  - ✓ Lifetime L80B50 > 50khrs
  - ✓ Standard offering 830, 835, 840; 927, 930, 935
- **Premium Color (under development)**
  - ✓ Brilliant Vivid (Below BBL)
  - ✓ Fresh Meat (*engineering sample available*)
  - ✓ Bakery (bread / cookies / bacon)
  - ✓ Seafood (fish / sashimi / oyster)
  - ✓ Jewelry (gold / silver / titanium)



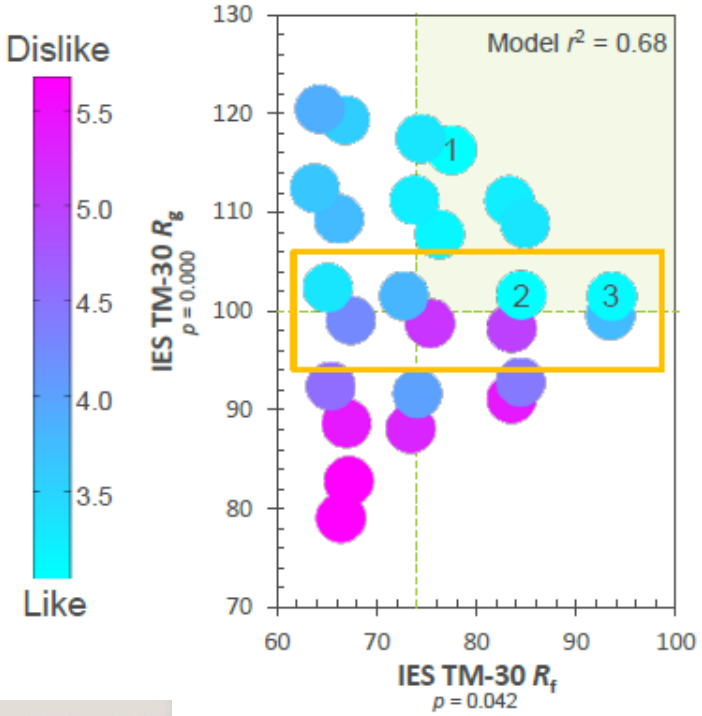
OSRAM

PrevaLED® Core Pro / Mini

I. High Performance and Quality of Light

- **Comply with IES TM30-15**
  - ✓ New and more accurate definition beyond CRI
  - ✓ Color Fidelity (Rf, 0-100)
  - ✓ Color Gamut (Rg, 60-140)
- **High Fidelity of CRI90 series**
  - ✓ **Rf 90, Rg 100**
  - ✓ CRI >90, R9 for deep red >50

TM30 (“99” different colors)



CRI (8 different colors)

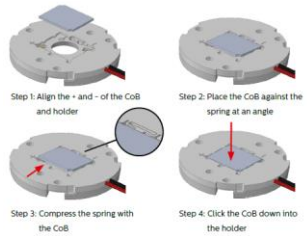
Conventional CRI only represent averaged color-rendering performance of eight different colors; in comparison, TM-30 is based on 99 colors chosen from various objects around our daily lives.

OSRAM

PrevaLED® Core Pro / Mini

II. Flexible Holder Options

- **Option 1: Solderless Type**
  - ✓ Simple and Reliable assembly process
  - ✓ D50 Zhaga compliant holder, D36 integrated with optical interface (pin-insert)
- **Option 2: Mechanical Type**
  - ✓ Cost-Effective assembly method
  - ✓ Integrated with optical interface (twist-and-lock)
- **Proprietary Holder Design**
  - ✓ Compatible with existing optics ecosystem
  - ✓ Embossed with “OSRAM” logo
  - ✓ Flexible COB + Holder combination to meet different customer needs



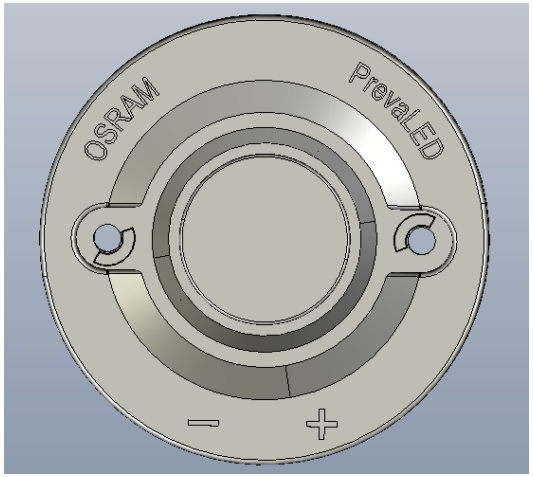
Holder Type	Pro LES19	Mini LES 14.5	Mini LES9.8	Basic LES 22	Basic LES 13	Basic LES 9	Basic LES 6
Solderless	D50	D36	D36				
Mechanical	D50 (A)			D50 (B)			
		D44 (A)			D44 (B)		
			D35 (B)			D35 (A)	D35 (A)

OSRAM

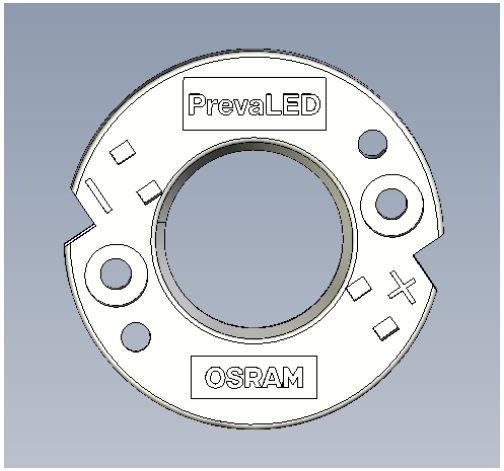
PrevaLED® Core Pro / Mini

II. Flexible Holder Options – Solderless

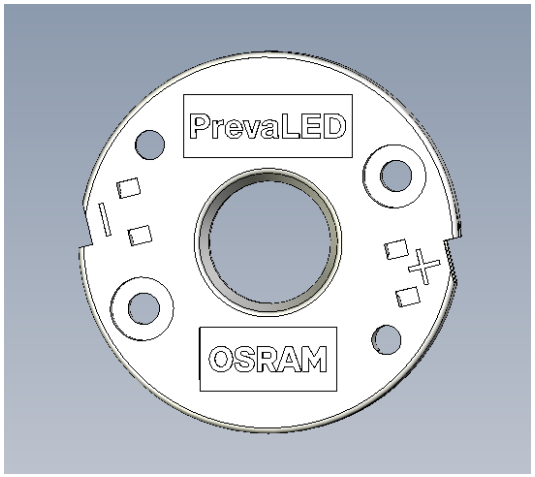
D50 (for Pro)



D36 (for Mini)



D36 (for Mini)



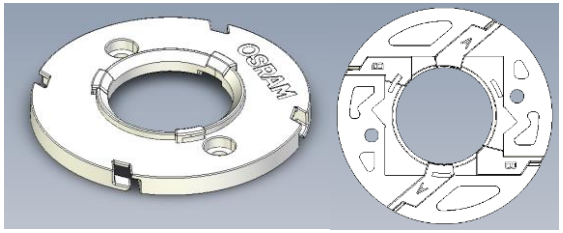
Holder Type	Pro LES19	Mini LES 14.5	Mini LES9.8	Basic LES 22	Basic LES 13	Basic LES 9	Basic LES 6
Solderless	D50	D36	D36				

- ✓ Reliable holder assembly solution
- ✓ Separable COB + Holder assembly
- ✓ Pock-in wiring, no need to do hand-soldering
- ✓ D36mm holder for compact fixture design
- ✓ D50 holder is Zhaga-compliant, D36 is integrated with optical interfaced (pin-insert) and compatible with Shinland standard optics (http://www.shinland.com.cn/)

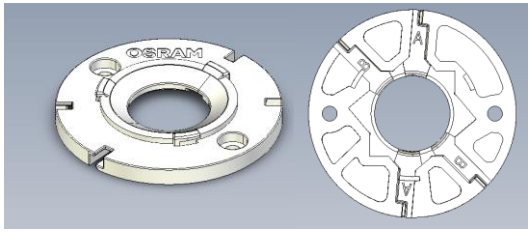
PrevaLED® Core Pro / Mini

II. Flexible Holder Options – Mechanical

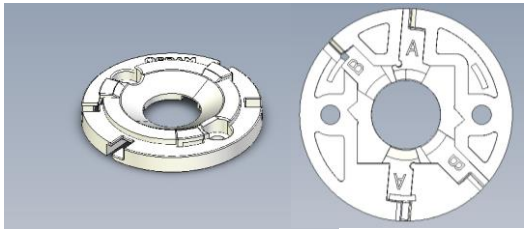
D50



D44



D35



Holder Type	Pro LES19	Mini LES 14.5	Mini LES9.8	Basic LES 22	Basic LES 13	Basic LES 9	Basic LES 6
Mechanical	D50 (A)			D50 (B)			
		D44 (A)			D44 (B)		
			D35 (B)			D35 (A)	D35 (A)

- ✓ Cost-effective holder solution
- ✓ Hand-soldering required
- ✓ D35mm holder for compact fixture design
- ✓ Integrated with twist-&-lock optical interface, compatible with Darkoo standard optics (http://www.darkoo.cc/en/index.html)

PrevaLED® CORE Pro / Mini

III. Wide Range of Flux Output from the same LES

- **Single LES Size for Each Series**
  - ✓ Core Pro: 3000 / 4000/ 5000lm (LES 19mm)
  - ✓ Core Mini: 2000 (LES 9.8mm), 3000 / 4000lm (LES 14.5mm)
  - ✓ Simplify optical solutions for various fixture-wattage
- **Provide High Flux Density options (Pro 5000, Mini 4000)**
  - ✓ Suitable for the optical requirement of High Central Intensity (CBCP)
  - ✓ Easier to minimize fixture design

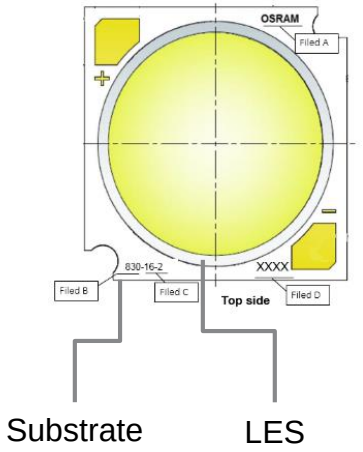
Design Example: COIN111 DC COB G1

1800lm and 2800lm (different COB having the same LES) can share the same optics to achieve 15°, 24°, 40°

PrevaLED® Core Pro / Mini

IV. Comply with Industrial Standard Package

- **Standard Package Design**
  - ✓ Substrate Size and LES follows industrial standard
  - ✓ Zhaga-Compliant LES and holder design
- **Benefit to COB Users**
  - ✓ Share the same ecosystem (holder, optics, driver)
  - ✓ Shorten the design lead-time
  - ✓ Drop-in replacement



Substrate size	Core Pro	Core Mini	Core Basic
13.35x13.35mm			LES 6.3mm
13.50x13.50mm		LES 9.8mm	
15.85x15.85mm			LES 8.9mm
17.85x17.85mm			LES 12.6mm
19.00x19.0mm		LES 14.5mm	
23.85X23.85mm	LES 19mm		
27.35x27.35mm			LES 22mm

Thank You.

www.osram.com
www.encelium.com

OSRAM Lighting Management System

Limitless lighting control at your fingertips

Rock Chen

OSRAM

Diversified needs of lights

LMS is a door opener, spec locker, differentiator against competitors!

- LMS is a solution-based offer according to customer's needs
- We help you to jump out from price war by comparing component features only
- We provide added value and services that allows premium pricing of total system offers

Energy saving

Comfort

Scenes

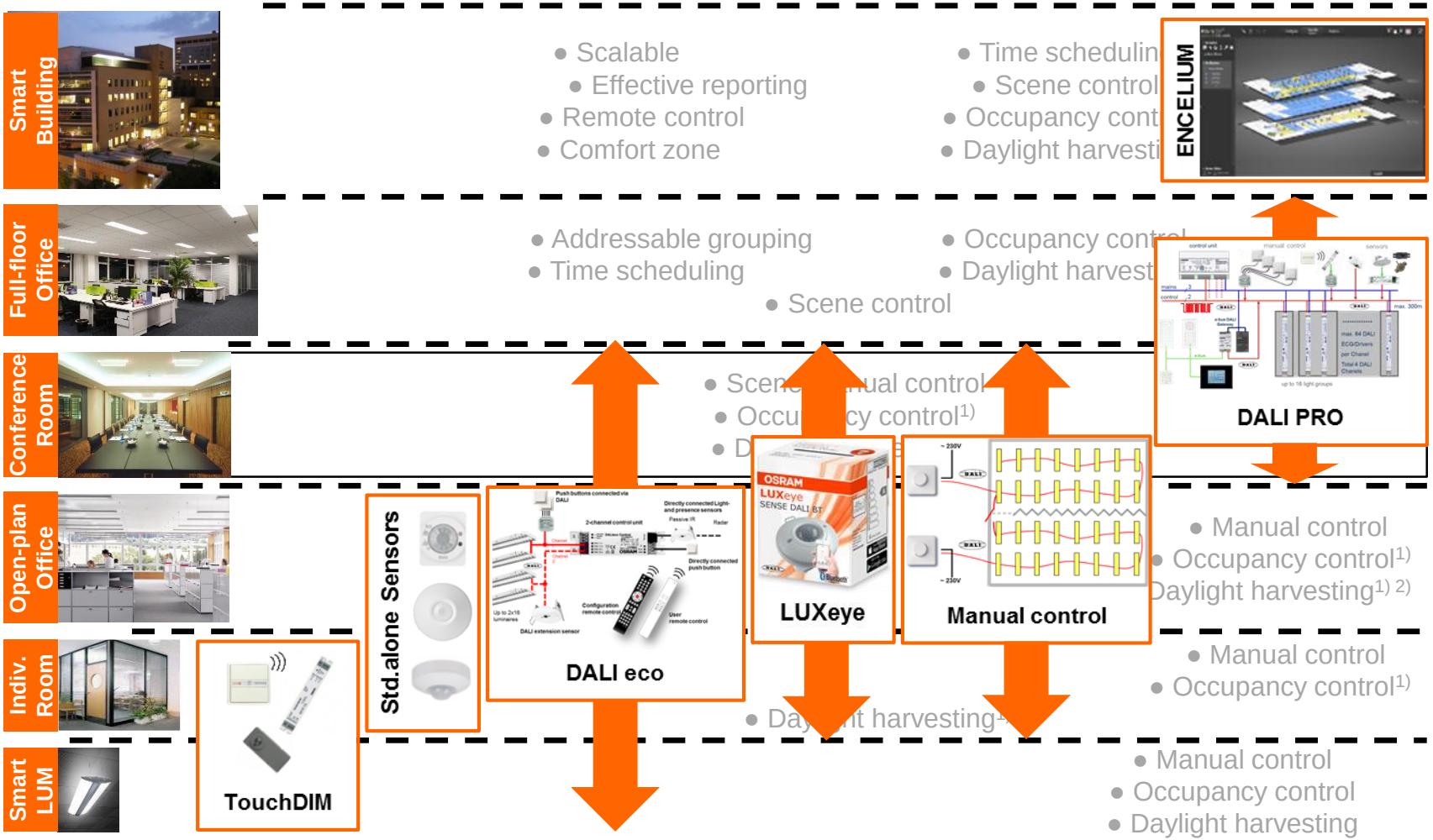
Working efficiency

Ambient

Light management system offers you the "Right Light"
– in the right amount, at the right place, at the right time

OSRAM

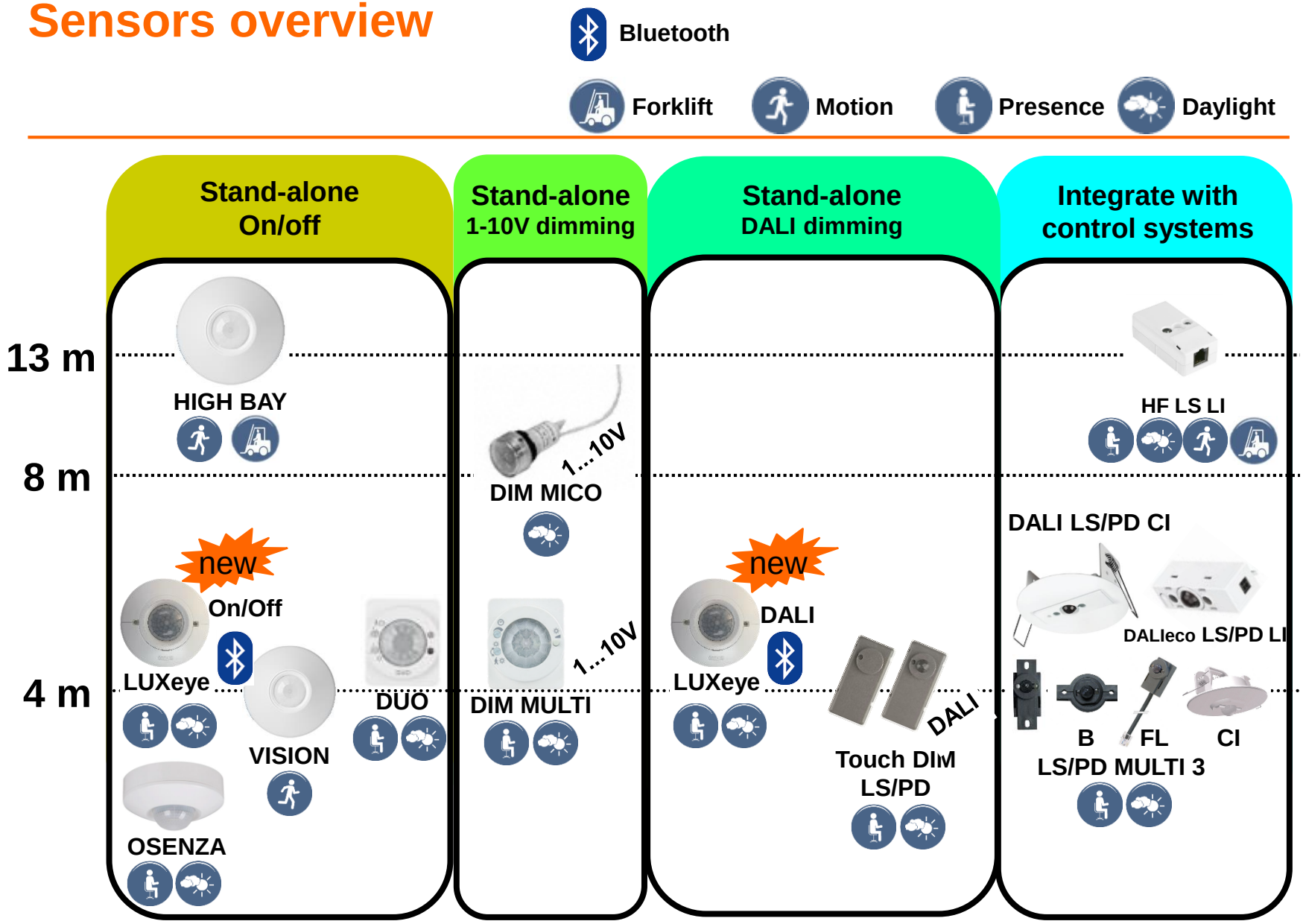
OSRAM offers LMS solution for all application scales
Application requirement and system matrix



1) Not for MCU 2) Not for “Vision” sensor

OSRAM

Sensors overview



OSRAM

B/S/H Chuzhou Warehouse lighting control

Highbay sensors + DUO Sensor

Project Location:	Chuzhou, China
Application:	Controlled area up to 10,000 m^2 Lightpoints 800+ LED highbay fixtures - Movement dection at 9.6m installation height - Daylight harvesting, switch off @150lux
Key Products:	• Highbay sensor 400+ pcs • DUO sensors
Key Success Factor:	• Reliable movement detection at Highbay • Maximum energy saving by switching off artificial lights when the daylight is sufficient • Good service in design-in stage and on site installation support

HIGH BAY

DUO

OSRAM

MCU/PCU

Simple manual dimming solution for comfort lighting

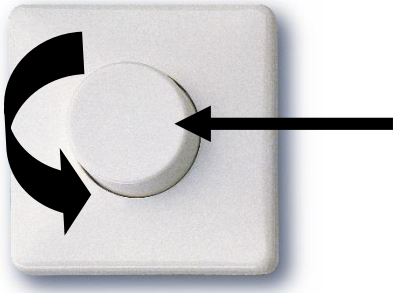
Jacob Ye

OSRAM

Manual Control Unit

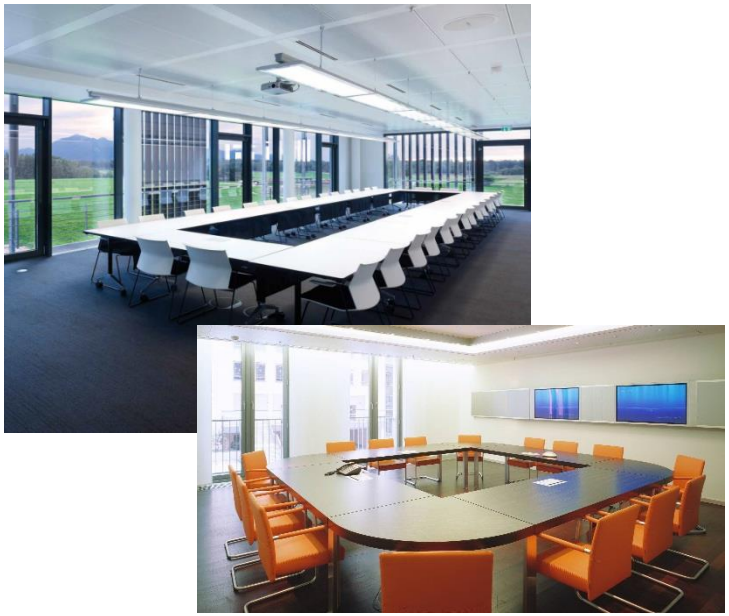
Rotary dimmer and Push Button dimmer

MCU - rotary dimmer

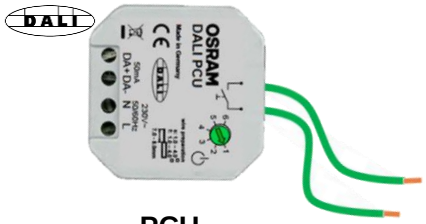


DALI MCU TW
DALI MCU
DIM MCU (1-10V)

- ✓ On/off – press
- ✓ Dimming – rotate
- ✓ Turnable White(TW) – Press + rotate



Push button Control Unit



PCU

Standard push button

- ✓ On/off – Short press
- ✓ Dimming – Long press
- ✓ Save light level – double press

- Simple, easy solution for plug & play control of lighting. No commissioning is required.
- The DALI PCU or MCU are expandable. Max. 4 push buttons or knobs for controlling up to 100 luminaires in parallel connection
- Suitable for individual office and meeting rooms

OSRAM

DALI MCU TW (tunable white / DT8)

Individual setting of color temperature and dimming level

plug & play

OSRAM

DIM MCU
Kunming Anthura Horticulture – Kunming, China

Project Location:	Kunming, China
Developer:	Kunming Anthura（安祖花公司）
Lighting Designer:	Anthura headquarter in the Netherlands
Application:	Floriculture greenhouse
Key Products:	QT 1X58 DIM, 11,000pcs DIM MCU, 500pcs
Success Factor:	Plug-and-play dimming according the required LUX level. Reliable quality after trail run for half a year

OSRAM

LUXeye

Intelligent light control with smart phone connection

Jacob Ye

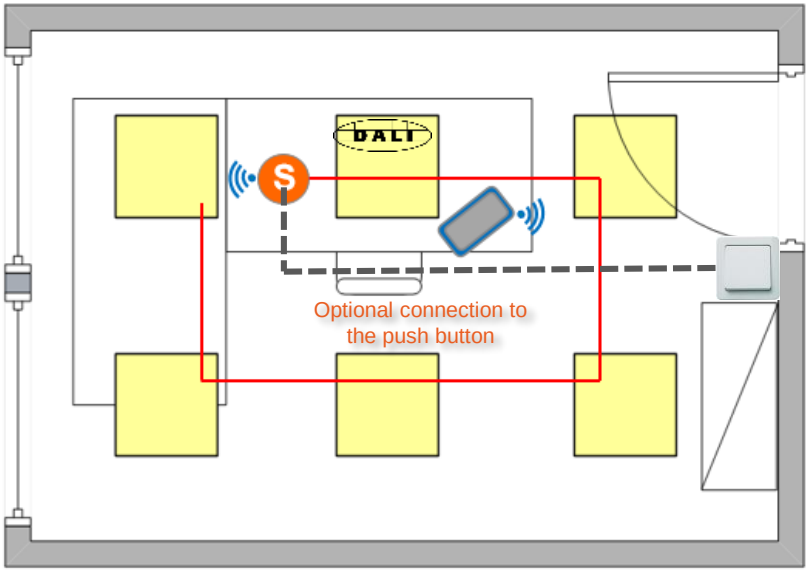
OSRAM

LUXeye Lighting Controls
Easy to install

NO COMMISSIONING NEEDED!

READY out of the box:

- Connect the DALI or On/Off luminaires to the sensor
- Power on the system
- Automatically starts operating after 30sek.
- Auto calibrating (80% of max. light output for DALI, and 500Lux for On/Off)



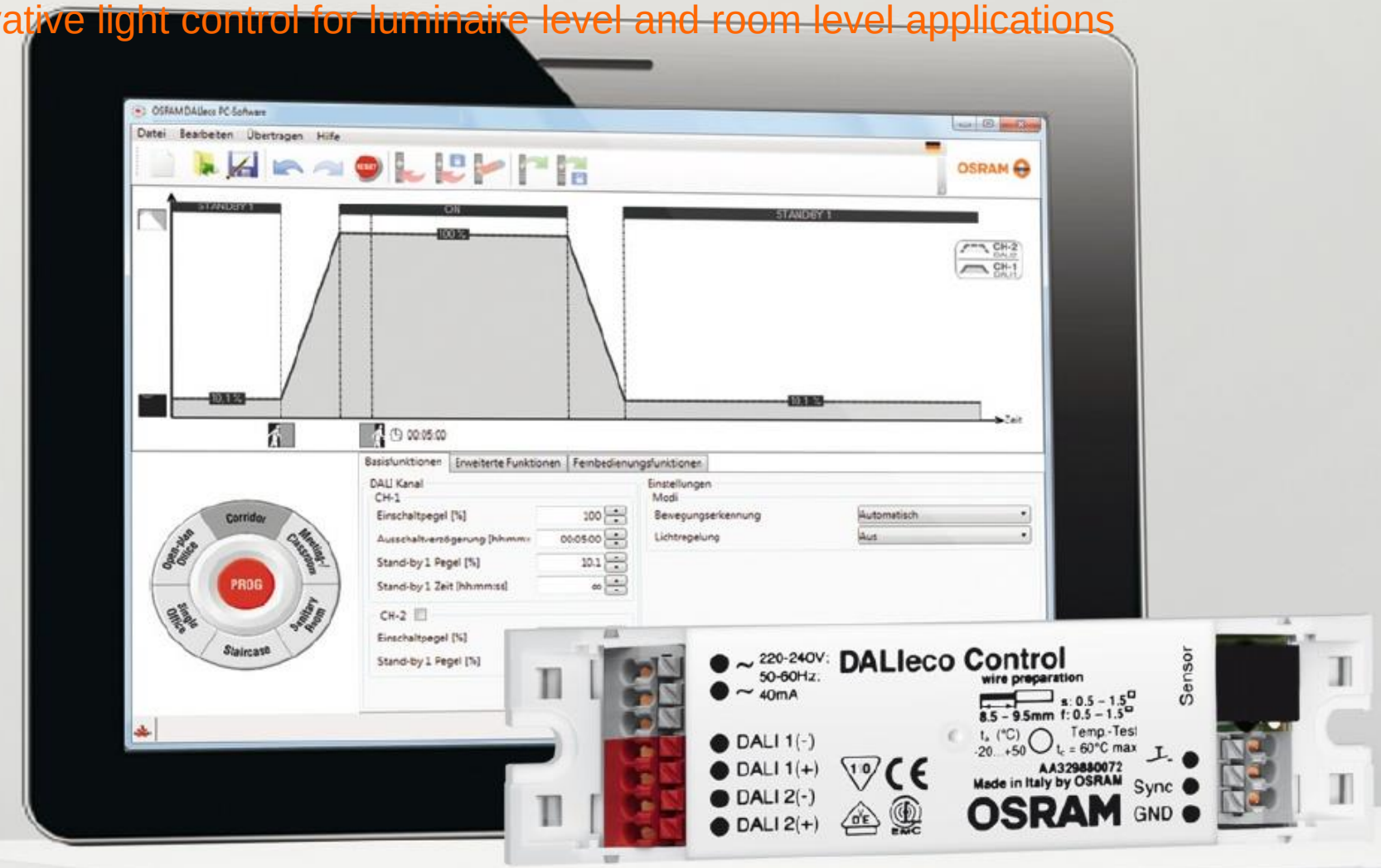
Max. 20 DALI devices supported by one LUXeye DALI

Control your light via Smartphone

- App available for Android and IOS
- Switch and dim your light at your desk
- Bluetooth technology for simple pairing.
  (As simple as connecting a headset!)
- No additional gateway needed!
- No additional hurdles (e.g. customer IT- Security)

DALIeco System – Configuration by mouse click

Innovative light control for luminaire level and room level applications

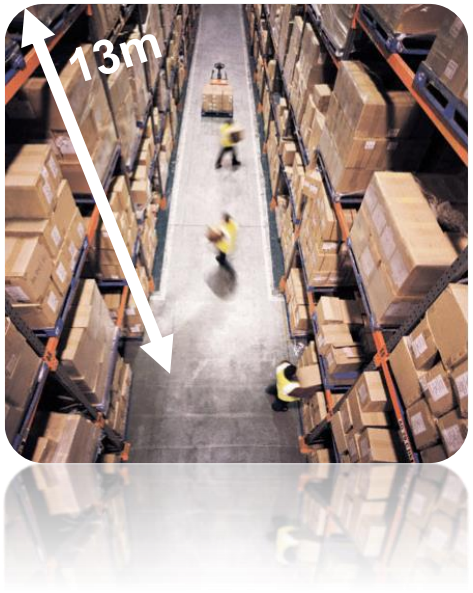


DALIeco System

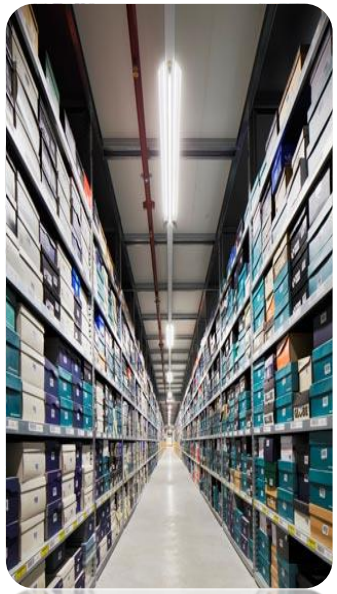
Target applications

DALIeco is an easy to use lighting control system with fast investment payback for various indoor applications by providing occupancy control, Daylight Harvesting, scene control and manual control for 2 broadcasting DALI channels of each max. 16 DALI luminaires per channel.

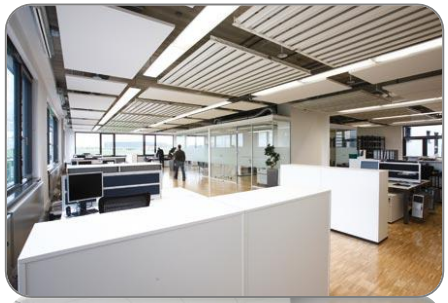
Warehouse

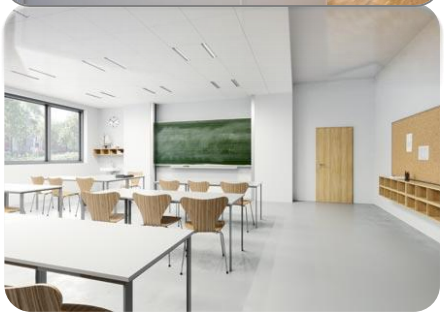


Corridor, stairway



open plan office





Class room
conference room

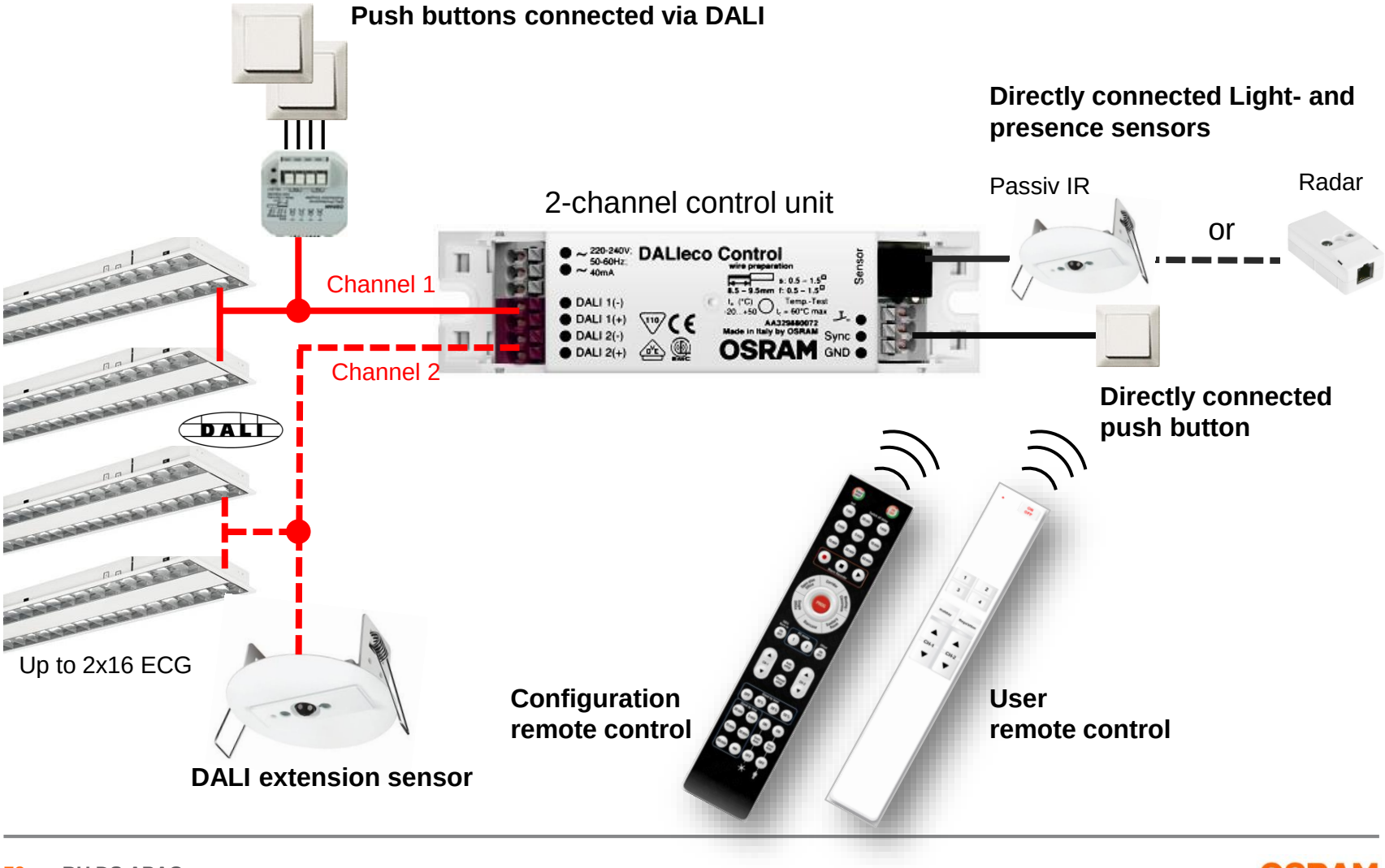
Intelligent
single luminaires

Single office

OSRAM

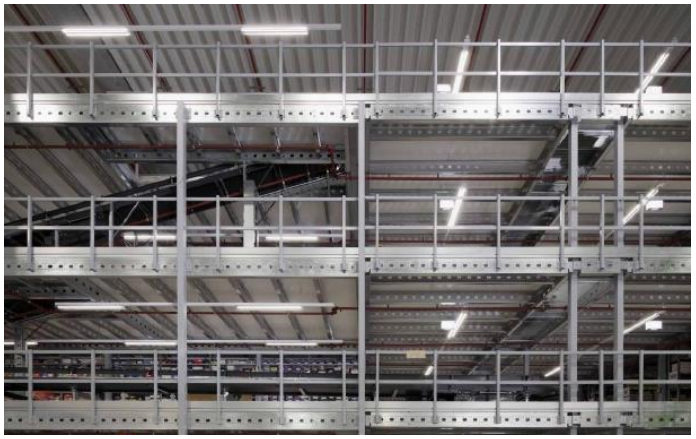
DALIeco System

System overview



Warehouse of Zalando

DALIeco for aisles occupancy detection



Project Information: zalando

<u>3rd Pick tower in Erfurt, Germany:</u>

Application:
Warehouse with > 1200 corridors

Realised by:
~10.000 QTi DALI DIM ECG + T5
2.500 OSRAM Radar Sensors + DALIeco controllers

Win Factor:
Extreme low standby power
Easy installation & setup

DALI PROFESSIONAL

Smart lighting system for energy saving and comfort

Jacob Ye

OSRAM

DALI PROFESSIONAL

For energy saving and comfort lighting

DALI PROFESSIONAL is a DALI-based addressable lighting control system offers energy saving and comfortable lighting solutions by smart automation and manual control.

Target applications:

It is a perfect solution for Office, Education, Multifunctional rooms, Hospitality, Retail & Shops, Industry, Warehouse, etc.

System features:

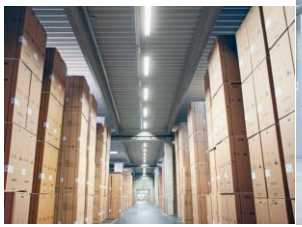
- ☑ Time scheduled control
- ☑ Occupancy detection and control
- ☑ Daylight Harvesting
- ☑ Scene control / recalling
- ☑ Manual on/off/dimming
- ☑ Addressable/flexible grouping

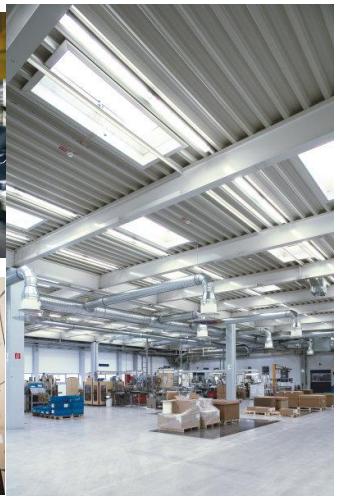
Office

Education

Industry

Warehouse





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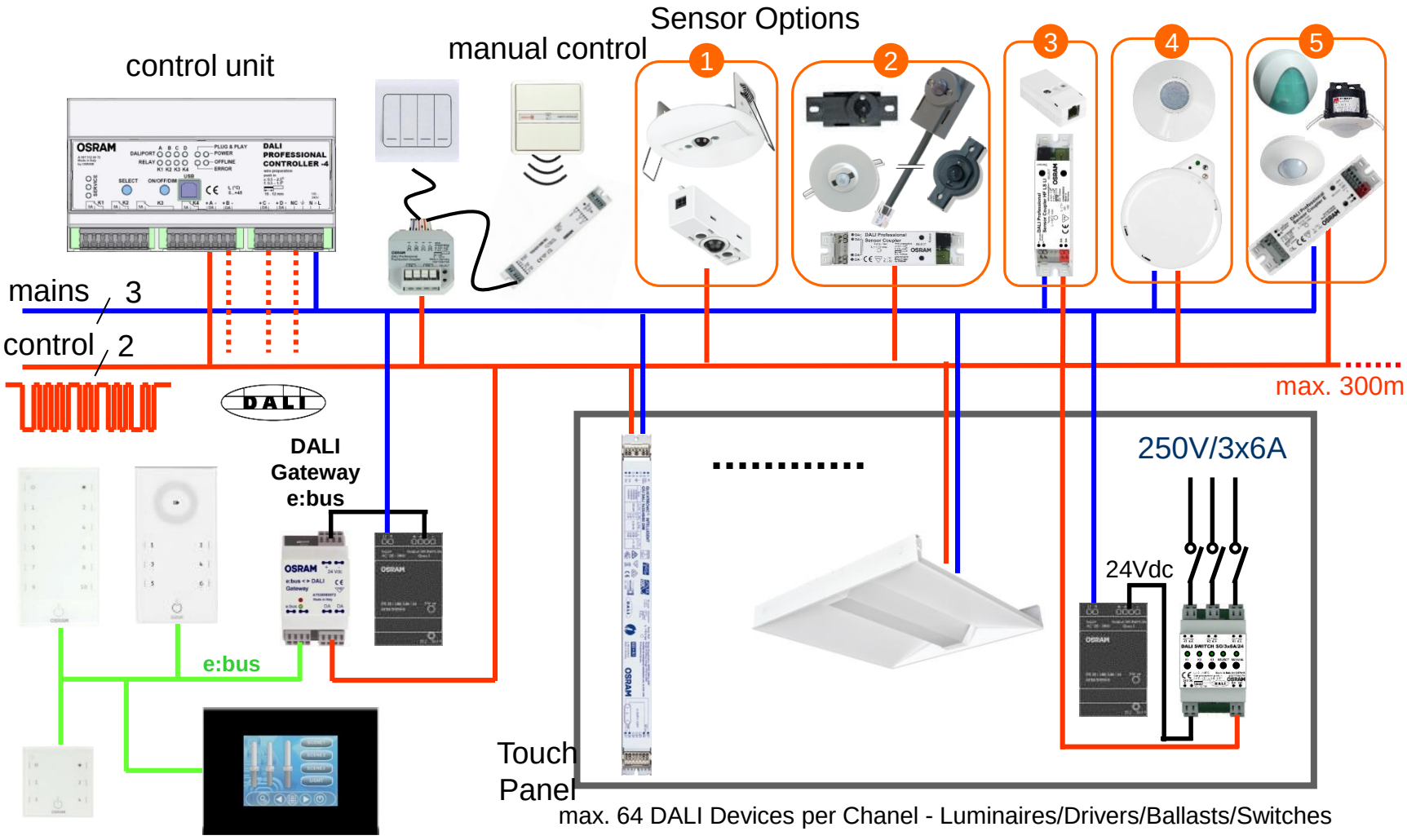
DALI PROFESSIONAL

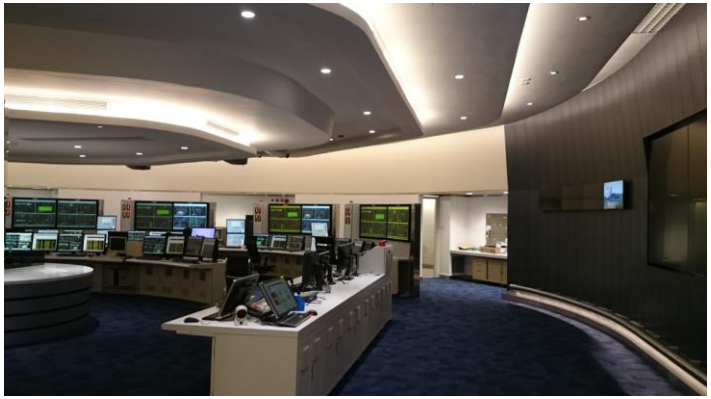
System Architecture

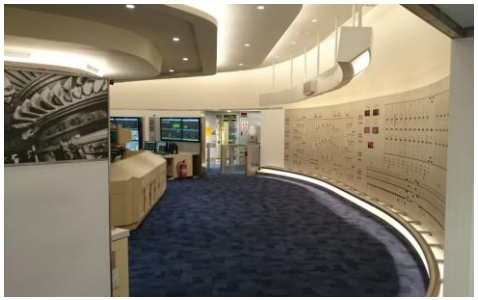


OSRAM

DALI PRO for Power station

Administrative building and Main control room





Project Location:	HongKong
OSRAM Partners:	Po Sin Sing Kee Engineering Co. Ltd(PSSK)
Application:	Administrative building and Main control room Black Point Power Station (CLP group)
Key Products:	• DALI PRO system, Sensors, Push button couplers, DALI switches, Touch Pannel
Key Success Factor:	• Comfortable light by scene control • Energy saving by sensors

OSRAM

DALI PRO for office and Conference rooms

16/F-27/F of New World Tower HongKong

Project Location:	HongKong
Application:	Office and conference room
Key Products:	• DALI PRO system, Sensors, Push button couplers, DALI switches
Key Success Factor:	• One system for all functions including lighting automations, control of fans, curtains and projector screen.

OSRAM

ENCELIUM

What are ENCELIUM® Energy Management Systems

ENCELIUM adds more to your light

ENCELIUM is a scalable networked smart lighting control system that enables effective energy saving, powerful reporting of the lighting spaces.

The ENCELIUM Energy Management System (EMS) dynamically responds to the changing characteristics of a building by providing the right amount of light when and where required.

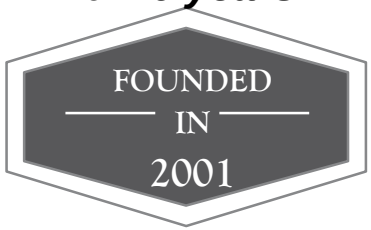
Scalable to applications

Attributes of ENCELIUM

a modern Light Management System

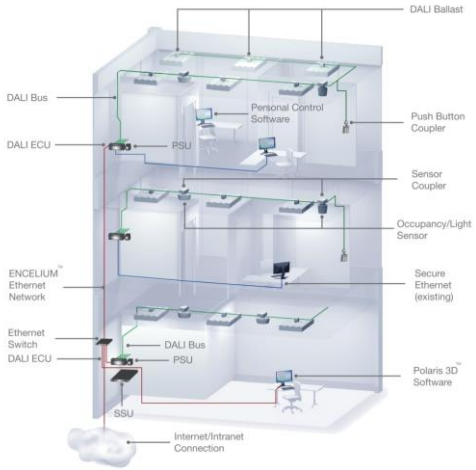
- ☑ Improves Lighting Quality
- ☑ Adapts to user needs
- ☑ Saves Energy
- ☑ Monitors Consumption
- ☑ Increases Building Value

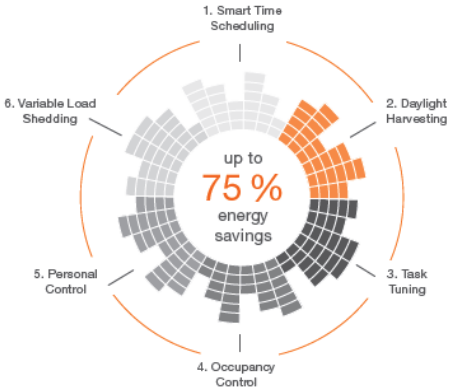
Lighting innovation for 16 years



Over 50 million square feet installed worldwide

ENCELIUM System – up to thousands of light points
An intelligent lighting system for Buildings





	SMART TIME SCHEDULING	10-50%
	DAYLIGHT HARVESTING	17%
	TASK TUNING	28%
	OCCUPANCY CONTROL	35%
	PERSONAL CONTROL	38%
	VARIABLE LOAD SHEDDING	10%
	COMBINED ENERGY SAVINGS	50-75% combined

OSRAM

ENCELIUM® Energy Management System

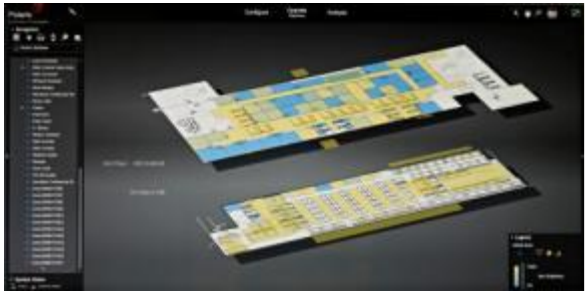
Polaris 3D® Software

Entire building control *at your fingertips* from any web browser

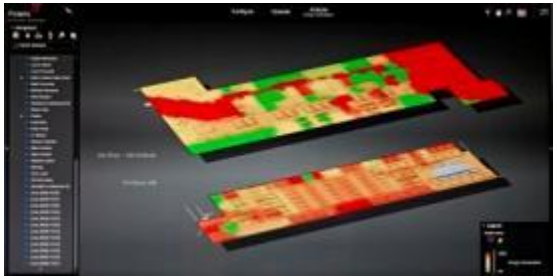
- Web & Windows based
- View, analyze, configure & report on settings & energy usage
- Intuitive visualization of space & energy usage across entire building
- Easy to use 3D floor plan based navigation

Lighting on/off status

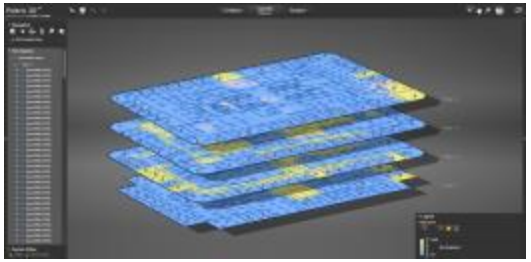
Zoom to view floor/space



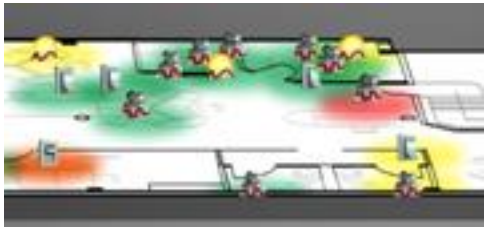
Energy usage/power density status



Multi-floor at a glance



Battery Life Indication

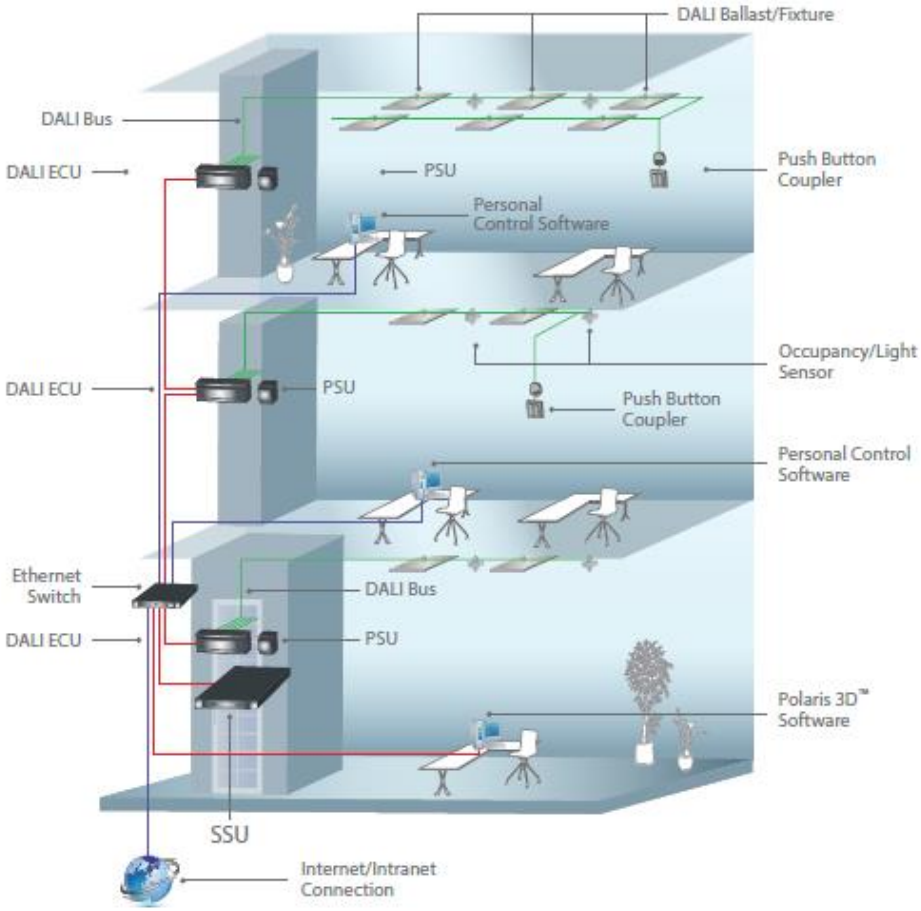


View Wireless Path

OSRAM

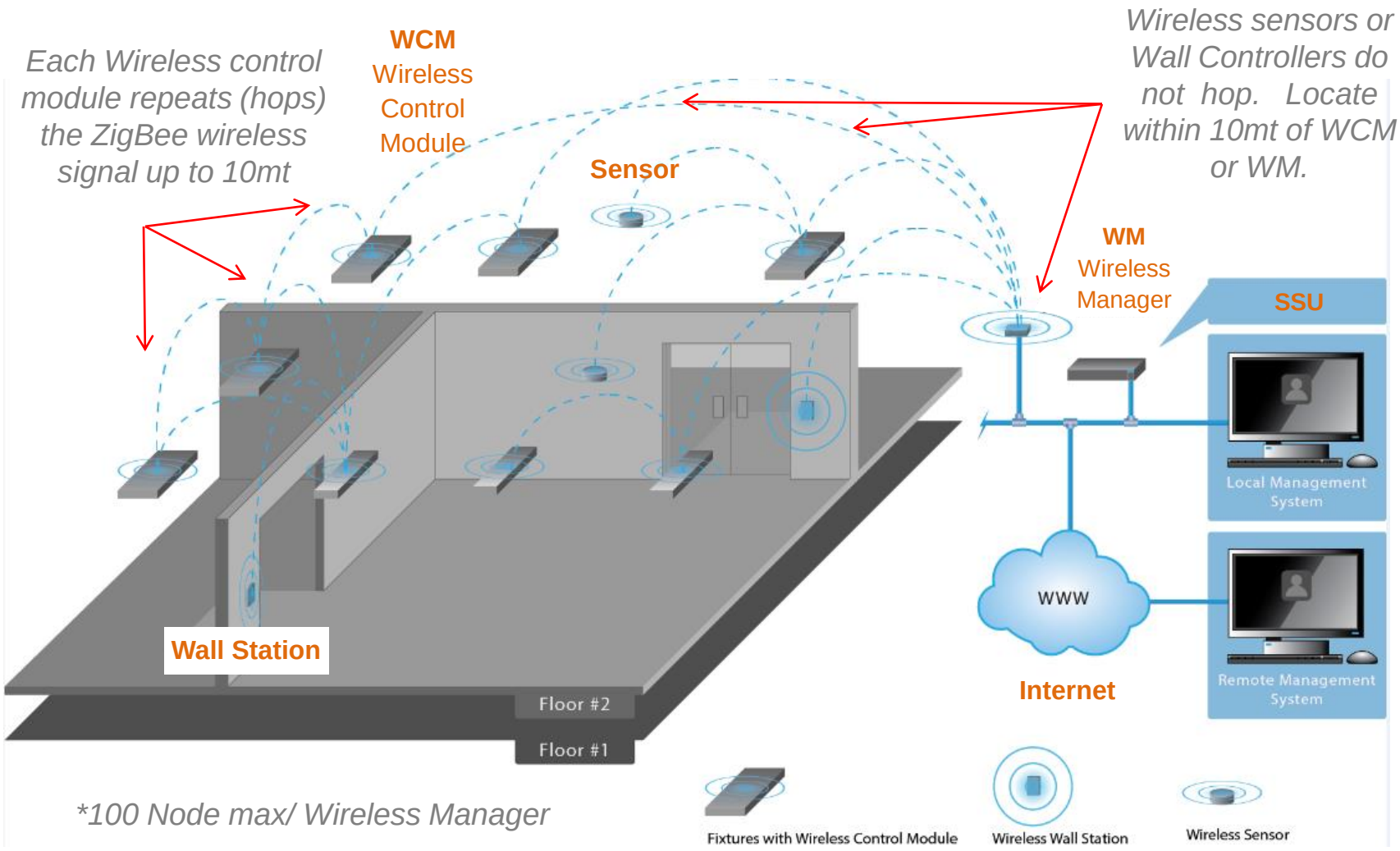
DALI Wired Architecture

- A 2-wire DALI bus is used to interconnect ECGs and couplers (sensors, pushbuttons)
- ECGs and couplers are interconnected in a daisy chain topology and networked back to a “DALI ECU” (Energy Control Unit)
- ECU's reside on IP backbone and are linked to existing local area networks (LANs) to enable personal lighting control
- 1 SSU (System Support Unit) required per project to store system database and web services



ENCELIUM ®

Wireless Architecture



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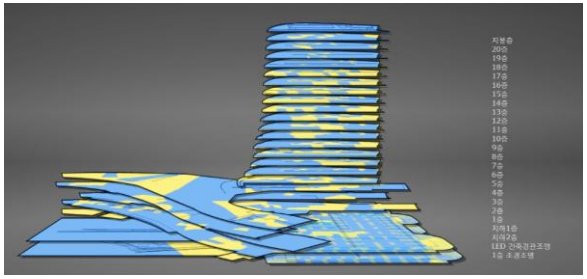
ENCELIUM®

LH head quarter, a construction company in Korea



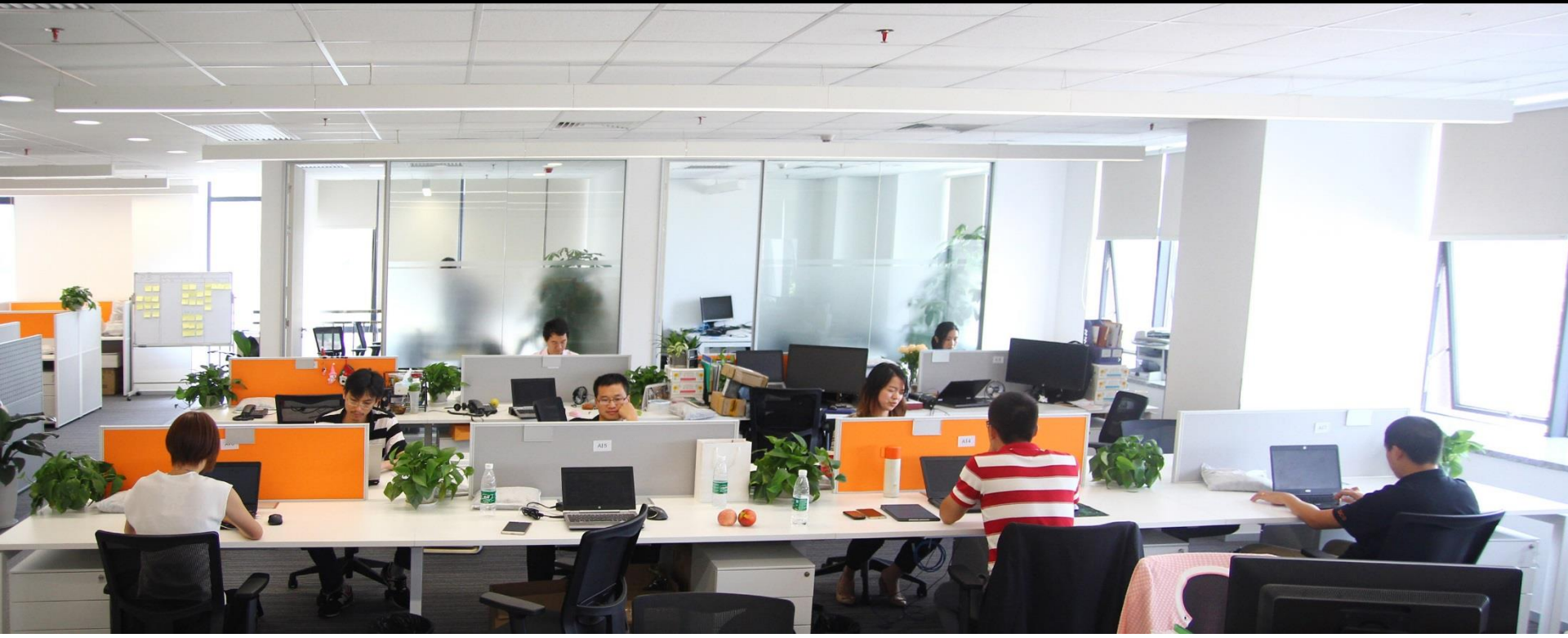
Project Location:	Korea
Application:	Office building
Customer	LH construction company, who has multiple offices in various locations in Korea. They are the builder for government apartments
Key Products:	• ENCELIUM system
Key Success Factor:	• Energy saving and effective reporting • Visualized / Intuitive user interface

OSRAM

ENCELIUM® Daylight harvesting
@ OSRAM New DCS office, Shenzhen, China

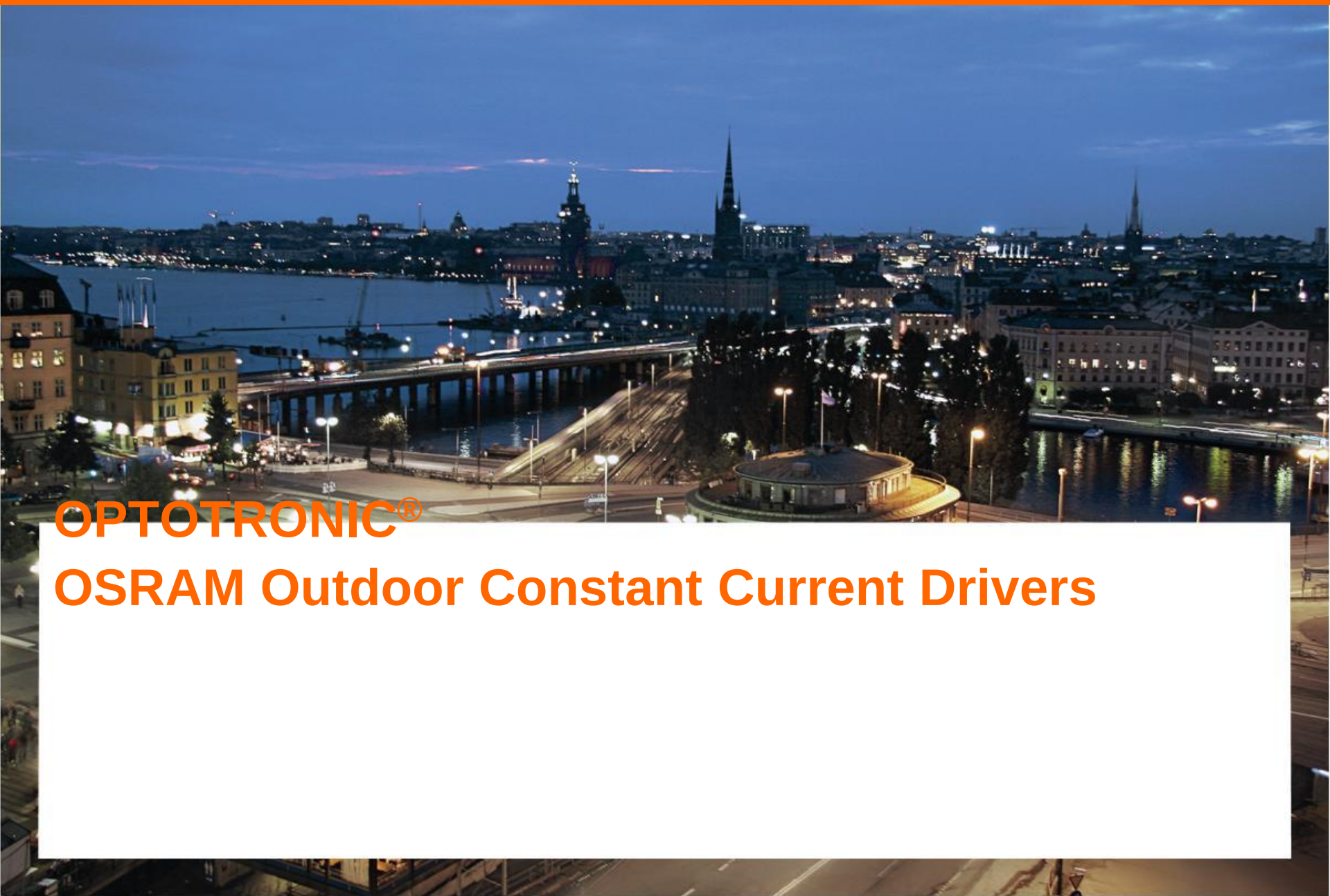
Daylight harversting - luminaires closed to the window are dimmed according to the incidence of natural light

引入自然光节能 - 靠近窗口的灯具根据射入自然光的强度自动调暗光输出



ENCELIUM® Occupancy control

@ OSRAM New DCS office, Shenzhen, China



OPTOTRONIC®

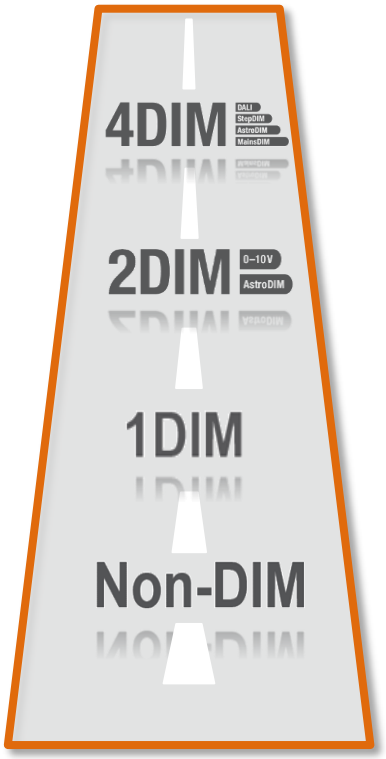
OSRAM Outdoor Constant Current Drivers

OPTOTRONIC® Outdoor LED Drivers

Market segmentation (APAC view)

A Available

D Development



Segmentation

OT 4DIM (AstroDIM, StepDIM, MainsDIM, DALI)
- Programmable & Window current (by DALI Magic)
- Surge 6kV / 8kV
- Class I/II, IP20

A

OT 2DIM (AstroDIM & 0 - 10V)
- Programmable & Window current (by OT Programmer)
- Surge 6kV / 6kV
- Class I/II, IP64

A

OT DIM (0 - 10V)
- UNV input
- Fix current output, 0-10V Dimming (10-100%)
- Surge 6kV / 6kV
- Class I, IP67

D

OT 1DIMA NFC (AstroDIM)
- Programmable & Window current (by NFC)
- Surge 6kV / 6kV
- Class I, IP67

A

OT Non-DIM
- UNV input
- Fix current output (700mA)
- Surge 6kV / 6kV
- Class I, IP65

A

OT Non-DIM SELV
- SELV Output & Window current (by Potentiometer)
- Surge 6kV / 6kV
- Class I, IP65

A

OSRAM

OPTOTRONIC® Outdoor LED Drivers
New generation – OT 1DIMA IP67 with NFC

OT DS OT APAC

Light is OSRAM

OSRAM

OPTOTRONIC® Outdoor LED Drivers – OT 1DIMA IP67 with NFC

Contactless Programming via NFC

EVERYWHERE , Fit for EVERYONE

Production line

Manufacturer

NFC

City Workshop

Distributor

NFC

In Field

Installer / Maintainer

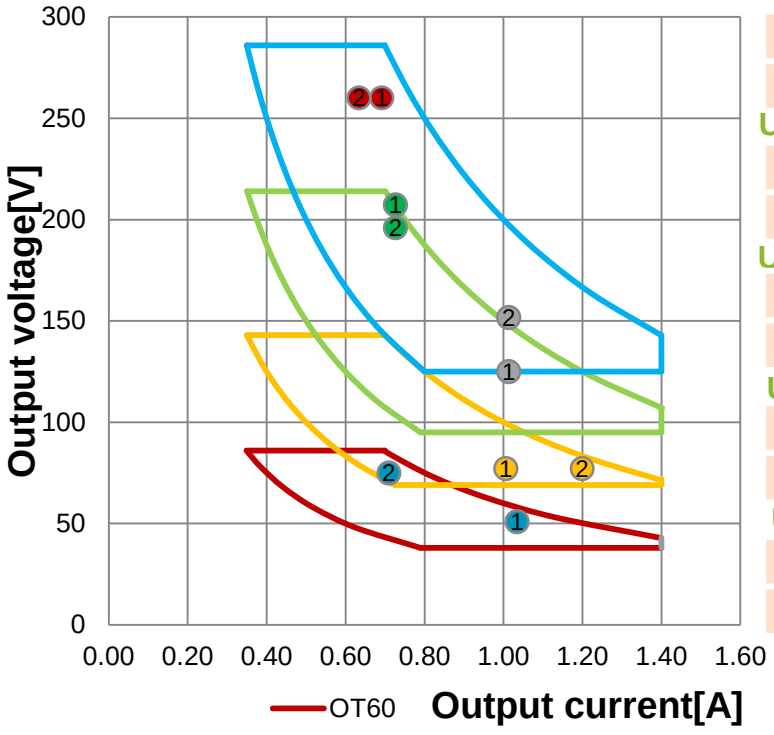
NFC *

*Tuner4TRONIC Diagnostic mobile apps to be available

OSRAM

OPTOTRONIC® Outdoor LED Drivers – OT 1DIMA IP67 with NFC

Window current - LED design FREE



Use case 1: Same Lens with different LED power (overdrive)

#1	75W	72V	1050mA	OT 100
#2	86W	72V	1200mA	

Use case 2: LED upgrade (less LED)

#1	150W	214V	700mA	OT 150
#2	140W	200V	700mA	

Use case 3: Same fixture with different module

#1	120W	114V	1050mA	OT 150
#2	150W	143V	1050mA	

Use case 4: Different type fixture (different PCB)

#1	50W	48V	1050mA	OT 60
#2	50W	72V	700mA	

Use case 5: Same fixture for different projects

#1	180W	257V	700mA	OT 200
#2	170W	257V	660mA	

Different design but **SAME** driver!
LED design **FREE** with Lean stock / Product model

OSRAM

Outdoor LED Power Supplies
New Generation – Non-dimmable
OT Outdoor High Current (SELV)

OSRAM

OSRAM OPTOTRONIC® LED Outdoor driver

OT Outdoor High Current (SELV) OT xxx/220-240/xxx P5

Product Description

- 100W, 150W, 200W are available
- Adjustable output current by potentiometer
- SELV output (<120V)
- Temperature Range -40°C ~ +55°C
- Surge Protection up to 6kV (L/N) and 6kV (L/N-/PE)
- IP65
- For Protection Class I
- Aluminum housing
- CCC/CE

ON/OFF

5 Year OSRAM Guarantee

Product Highlights

- Lifetime up to 100.000h at Tc(max) – 10C;
- Easier fixture design – SELV and Adjustable current
- Protection against moisture and dust with IP65
- Robust design resistant to vibration and shock
- Cables

Application:

CC

- Outdoor lighting
- Street, Urban and Industrial lighting
- Luminaires for harsh operating conditions

OT Outdoor High Current (SELV)

Max Flexibility: Adjustable output current

Easy setup

Waterproof Adjustable output current

one original screw driver in each packing box

Turn the screw driver to adjust output current of driver with the power meter.

Close the waterproof cap and finished

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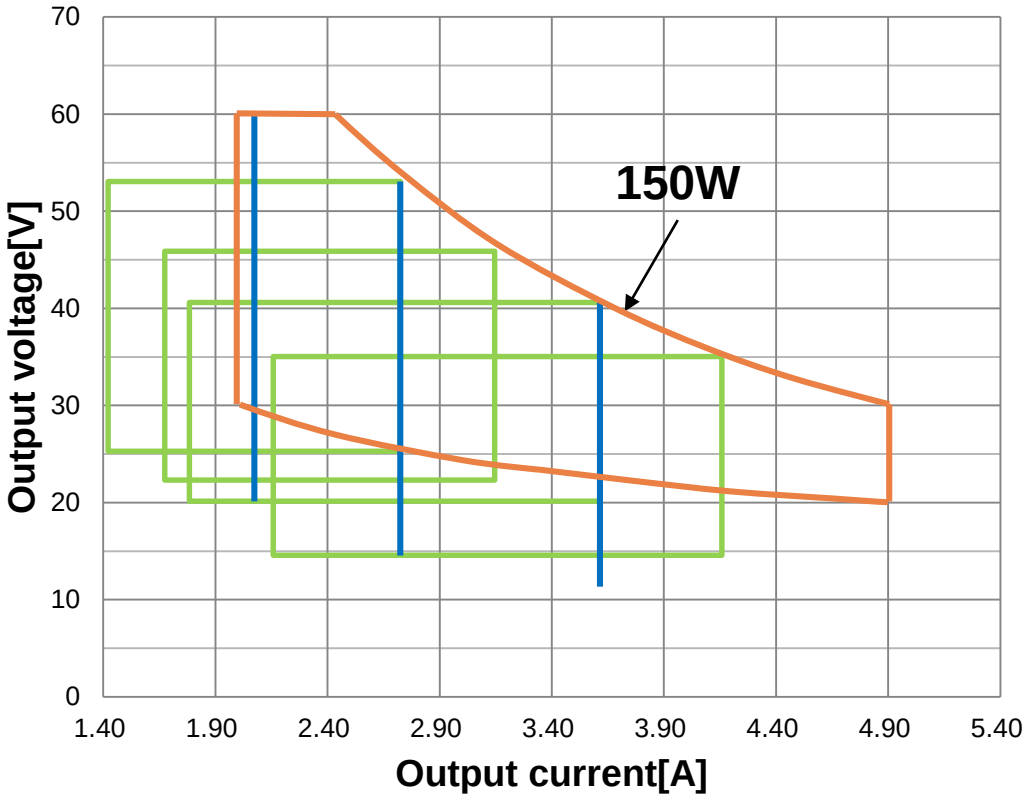
OT Outdoor High Current (SELV)

Max Flexibility: Constant power Window current



A brand
Fix output
(3 modules)

B brand
Current adjustment
(4 models)

OSRAM
Window current
(1 model)

1 model can replace >3 models → Save Approbation and Logistic cost

OSRAM

Many Thanks.

OSRAM