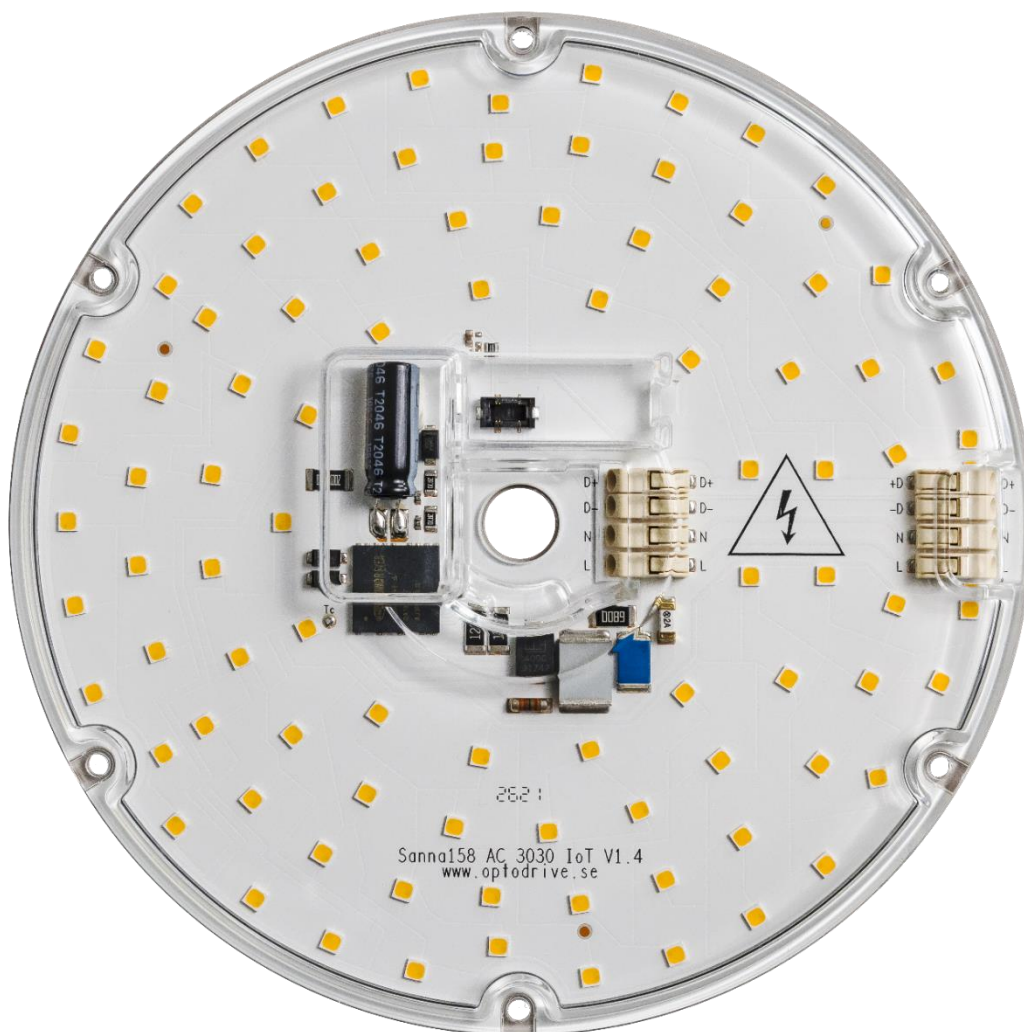




SANNA158 AC



SANNA AC

12W | 20W

Round LED-module for lightings with opalized glass.

No driver is required



Key features

Sanna158 is specifically crafted for downlights and environments where the focus is on creating a welcoming and comfortable ambiance, whether for social interactions or professional tasks. With integrated drivers, these AC LED light engines simplify installation and offer versatile dimming options. Sanna sets a new benchmark for efficiency, delivering outstanding light output tailored for both aesthetic and functional lighting needs.



1. Integrated Smart Lighting

- Built-in drivers with possible support for **DALI**, **Casambi**, and other smart control systems, offering seamless dimming options.

2. Effortless Connectivity

- Direct connection to **230VAC** with no external drivers required, simplifying installation across different environments.

3. Flicker-Free Dimming

- Provides smooth, flicker-free dimming using either standard dimmers or smart control protocols for consistent, comfortable lighting.

4. IoT-Ready

- Easy integration into **IoT ecosystems**, enabling smart control and energy efficiency for both personal and commercial applications.

5. Sustainable Design

- Compliant with the latest **EU circular economy** directives, making it both eco-friendly and future-proof.



SANNA158 AC IOT

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Introduction

The Sanna158 LED module offers versatile dimming capabilities, working seamlessly with standard dimmers right out of the box. For more advanced, intelligent lighting control, our compact DimIn unit can be integrated, enabling compatibility with DALI, Casambi, or other communication protocols. This opens up new possibilities where the distinction between a single fixture and an interconnected system becomes fluid, allowing for highly personalized and intuitive lighting solutions. The only limit is how you choose to control the light from this LED module.

Sanna158 Package

Designed for pendant applications, the Sanna158 is a round LED light engine with a centered hole for easy wire integration. Its plug-in connectors allow for quick and straightforward setup. With the option to integrate smart systems like DALI, Casambi, or other IoT-based protocols, this module fits into various lighting ecosystems. Additionally, all IoT LED modules feature an electrically isolated heat pad, ensuring safety and compatibility with Class II fixture installations.

Light Quality

Maintaining color stability is a priority, ensuring consistent and even light output throughout the installation's lifespan. Key parameters such as precise binning, long lifetime, and efficient thermal management are carefully controlled to deliver superior performance and longevity.

Dimming Capabilities

Sanna158 stands out with its impressive dimming capabilities. Whether using traditional phase dimmers or advanced communication protocols like DALI or Casambi, this module minimizes flicker and other unwanted effects, ensuring a smooth and pleasant lighting experience.

Smart Lighting

The Sanna158 LED module is IoT-ready, designed to integrate easily with systems like Casambi, DALI, or other communication standards. Our goal is to make smart lighting accessible to small and medium-sized manufacturers, allowing them to incorporate advanced controls without requiring extensive technical expertise. Whether it's straightforward integration or the addition of new smart features, the process is simple, aligning with the latest EU directives on the circular economy for sustainable, future-proof solutions.

Smart Lighting with IoT

The world of lighting design is evolving rapidly, and smart LED engines are leading the charge. With IoT technology, designers can now integrate DALI and Casambi directly into their lighting systems, creating dynamic, adaptable environments. From enhancing comfort in workspaces to crafting immersive lighting experiences, smart lighting provides an unparalleled level of control.

Imagine having these capabilities built into your LED module from the start—Optoga makes it possible. The compact, sugar-cube-sized DimIn modules are the key. They seamlessly fit into our IoT interface and can be easily swapped between DALI, Casambi, or even basic dimming controls, making smart lighting accessible to everyone. All that's needed is a mains connection (230VAC) and two wires—either for DALI or for connecting a potentiometer or switch.

Platform	Table- or freestanding light	Downlight	Spotlight	Pendent	Medium size Opaque glass	Medium size Opaque glass HCL/TW	Big size Opaque glass
							
Lilly80 AC IoT	X	X		X	X		
ADA60 AC IoT	X	X	X	X	X		
ADA76 AC IoT	X	X	X	(X)			
Sanna158 IoT	X			X	X		
Sanna158 AC IoT HCL				X		X	
Sanna290 IoT				X			X

DimIn Modules for Ultimate Control

- **DALI:** Our DALI-compatible device works seamlessly with DALI-2 systems, offering precise control over lighting with bus-powered simplicity.
- **Casambi:** Casambi isn't just wireless control—it's a smart, connected lighting system that can respond to changing environments, adjust brightness, and create human-centered lighting that enhances well-being and productivity.
- **Switch:** Use a momentary switch for simple, smooth dimming control in freestanding devices.
- **POT:** The potentiometer option allows easy dimming (up/down) and on/off functionality, perfect for standalone fixtures.

Potentiometer Control

With our easy-to-use potentiometer, users can enjoy intuitive lighting control. The click mechanism provides tactile feedback for on/off, while a smooth clockwise rotation increases light intensity on a logarithmic scale—ideal for precise control over ambiance.



Short form Characteristics

MECHANICAL		12W version	20W version
Module dimension with cover		158.5 mm diameter	
Weight		TBD	
Assembly holes		6 x M3	
Wire connector		Poke in	
ELECTRICAL			
Power		12W	20W
Input voltage		230VAC	
Input voltage range		220-240VAC	
Power factor		0.80	0.80
Total harmonic distortion		<15%	
Type of current		AC	
Peak inrush current		TBD	
Inrush current duration		TBD	
Surge protection		4000V	
Fast transient burst		2000V	
Over temp. protection		150°C	
Energy class	CRI90 2700K	E	E
	CRI90 3000K	D	D
PHOTOMETRICAL			
Flux nominal		1400lm	2340lm
Efficiency		>117lm/W	>117lm/W
Number of LED's		80	
Rendering index		>Ra90 (R9>60)	
SDCM (Mac Adam)		3	
SVM		0.3	
PstLM		0.3	
Spread angle lens		130°	
Colour temperatures		2200, 2700K, 3000K, 4000K	
ENVIRONMENTAL			
Temperature range		-40°C to 65°C (Absolute maximum temp Tc 65°C)	
Relative Humidity		10-75%	
Ambient air pressure		500-1060 hPa	
LIFE LENGHT			
Life length L70B10		>50 000h	

*Specifications are valid for >Ra90.



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Datasheet SANNA AC.P.230.xx.zyy-NN.IOT

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Article number structure

Sanna158 AC.P.230.80.9yy-NN.FF.IOT

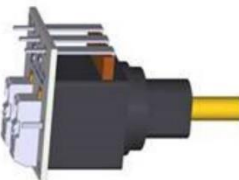
AC	AC= 230VAC, ED=External Driver required, ID=Internal Driver
P	Power (Watt)
V	Voltage: 230VAC
N	Amount of LEDs
8	CRI: 8=Ra>80, 9=Ra>90
YY	CCT: 22 =2200K, 27 =2700K, 30 =3000K, 40 =4000K 2760=CCT changeable
NN	Viewing angle code
FF	Flickerfree to meet EPREL
IOT	Possibility to connect Casambi and DALI, still fully dimmable from mains

Article name and versions

ARTICLE NAME	POWER	CURRENT	CRI	CCT	LENS	Lumen		Energy Class
						25°C	65°C	
Sanna158 AC.12.230.80.927-130.IOT.FF	12	230	90	2200	110°	960	860	F
Sanna158 AC.12.230.80.927-130.IOT.FF	12	230	90	2700	110°	1230	1100	E
Sanna158 AC.12.230.80.930-130.IOT.FF	12	230	90	3000	110°	1300	1230	D
Sanna158 AC.12.230.80.940-130.IOT.FF	12	230	90	4000	110°	1350	1190	D
Sanna158 AC.20.230.80.927-130.IOT.FF	20	230	90	2200	110°	1490	1410	F
Sanna158 AC.20.230.80.927-130.IOT.FF	20	230	90	2700	110°	1940	1860	E
Sanna158 AC.20.230.80.930-130.IOT.FF	20	230	90	3000	110°	2140	2030	D
Sanna158 AC.20.230.80.940-130.IOT.FF	20	230	90	4000	110°	2180	2110	D
Sanna158 AC.12.230.80.927-D.IOT.FF	12	230	90	2200	110°	900	780	F
Sanna158 AC.12.230.80.927-D.IOT.FF	12	230	90	2700	110°	1100	1000	E
Sanna158 AC.12.230.80.930-D.IOT.FF	12	230	90	3000	110°	1160	1050	D
Sanna158 AC.12.230.80.940-D.IOT.FF	12	230	90	4000	110°	1180	1070	D
Sanna158 AC.20.230.80.927-D.IOT.FF	20	230	90	2200	110°	1460	1290	F
Sanna158 AC.20.230.80.927-D.IOT.FF	20	230	90	2700	110°	1840	1650	E
Sanna158 AC.20.230.80.930-D.IOT.FF	20	230	90	3000	110°	1900	1740	D
Sanna158 AC.20.230.80.940-D.IOT.FF	20	230	90	4000	110°	1920	1760	D



DimIn (Function module)

Article code	ARTICLE NAME	DimIn design	DimIn Potentiometer design
105390	DimIn DALI		
105111	Dimin Casambi		
105652	DmIn Switch		
105040	DimIn PoT		
105148	Dimin Potentiometer		

Ordering data

Lilly80 – Packaging information

Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner Box	40	68.2	12.4	16.6	6.3
Outer Box	180	70.0	48.2	17.0	12.7

DimIn – Packaging information

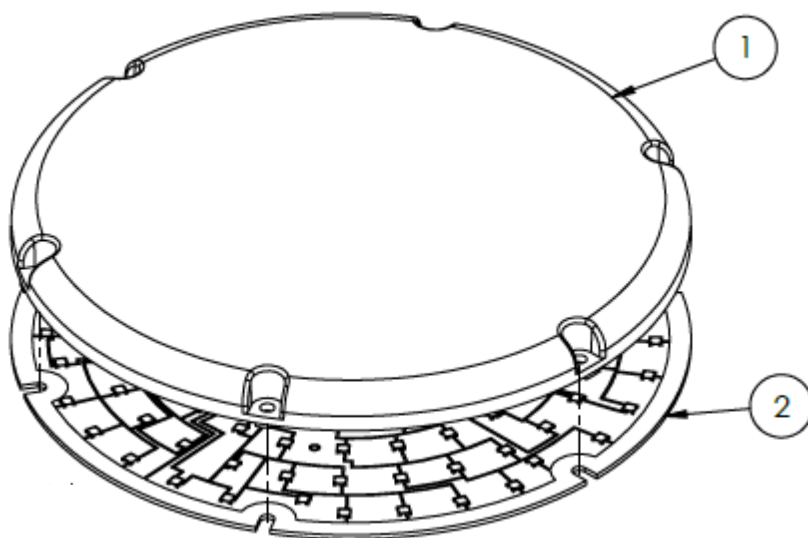
Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner Box	72	35,6	22,7	9,6	
Outer Box	2304	46,5	37,5	39,6	TBD

Potentiometer – Packaging information

Description	Qty (pcs)	Dimension (cm)			GW (kg)
		Length	Width	Height	
Inner Box	TBD	35,6	22,7	9,6	
Outer Box	TBD	46,5	37,5	39,6	TBD

Mounting and de-mounting instructions

The LED module is to be fixated with screws before the wire connection is made. Never connect or disconnect the LED module with the power ON. Read the information under "Precautions for use" before handling the device.



1. Sanna cover
2. Sanna PCB

Wiring

Type of wire	AWG	mm ²
Stranded	22-20	0.32-0.5mm ²
Solid	24-18	0.51-1.02Ø (0.2-0.8mm ²)
Insulation diameter	Max 2.1 mm	



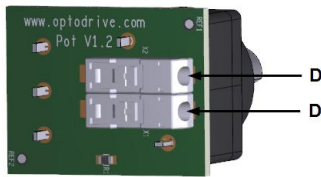
Mount the device on heatsink with screws safely

The LED module with the nomenclature IoT can be expanded with additional functionality, has terminal blocks with the texts N for zero, L for phase, D- and D + for dimming function with either Dali or a potentiometer.

DimIn

To obtain additional functionality, the LED Module needs to have an additional module mounted in the IoT interface.

Potentiometer card

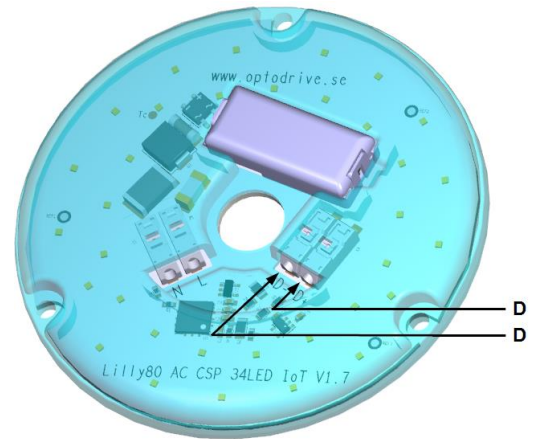


The Pot potentiometer board works with the DimIn Pot functionality module. D + or D- play a certain role as they change the dimming direction depending on the connection.

Wire Connections (DALI or other)

Connect BUS control cables from the DALI control unit or Master unit (standard product that Optoga does not supply) or cables from DimIn Pot to D + and D- on the LED module. This depends on whether there is a DALI or DimIn Pot module mounted on the LED module.

DALI is polarity independent so it does not matter which of D+ and D- is connected.



Connector

Type	Push In type
------	--------------

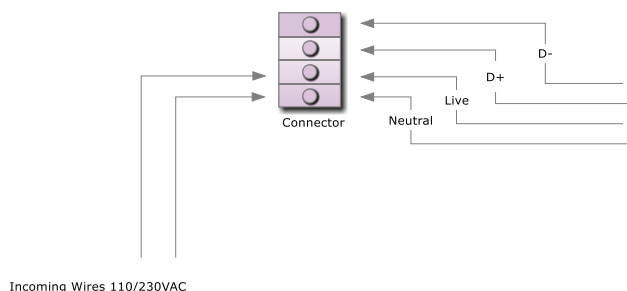
Wire (Recommended)

Type of wire	AWG	mm ²
Stranded	22-20	0.32-0.5mm ²
Solid	24-18	0.51-1.02Ø (0.2-0.8mm ²)
Insulation diameter	Max 2.1 mm	



Wiring for different DimIn versions

Casambi

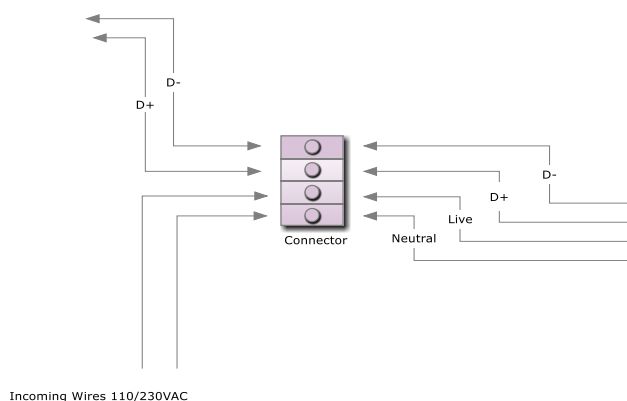


LED Module with IoT (DimIn Casambi)



DALI

DALI BUS Incoming

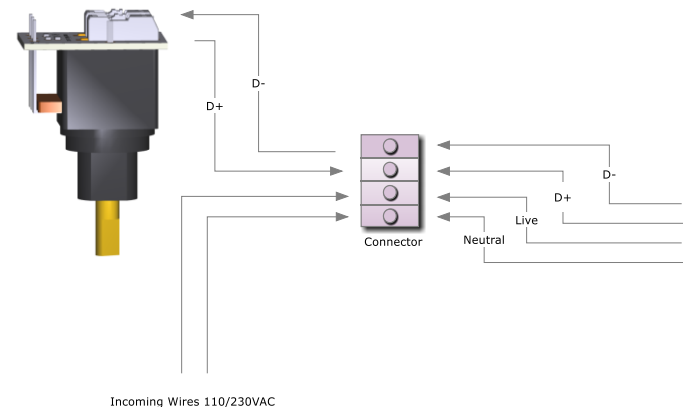


LED Module with IoT (DimIn DALI)

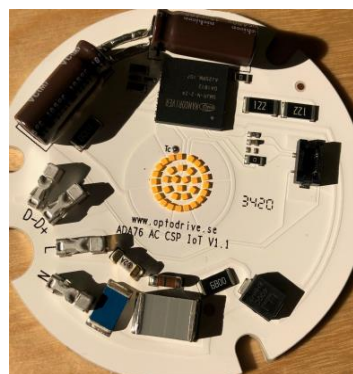


POT / Potentiometer

Potentiometer

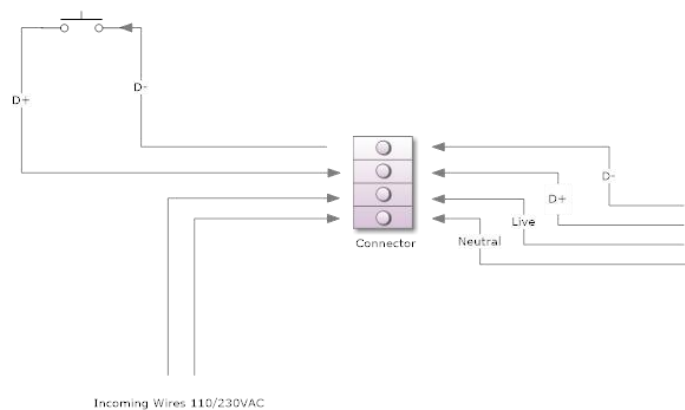


LED Module with IoT (DimIn POT)

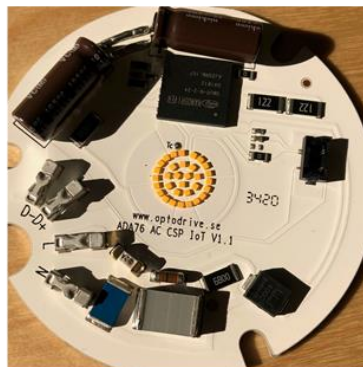


DimIn Switch (Switch-Dim)

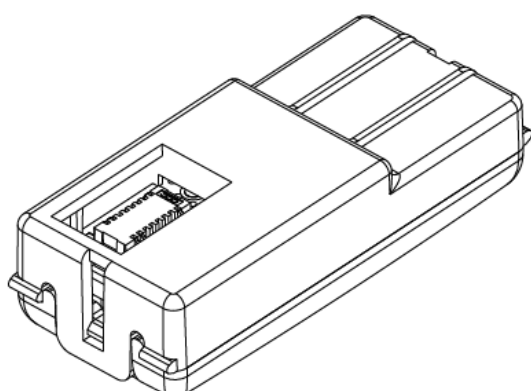
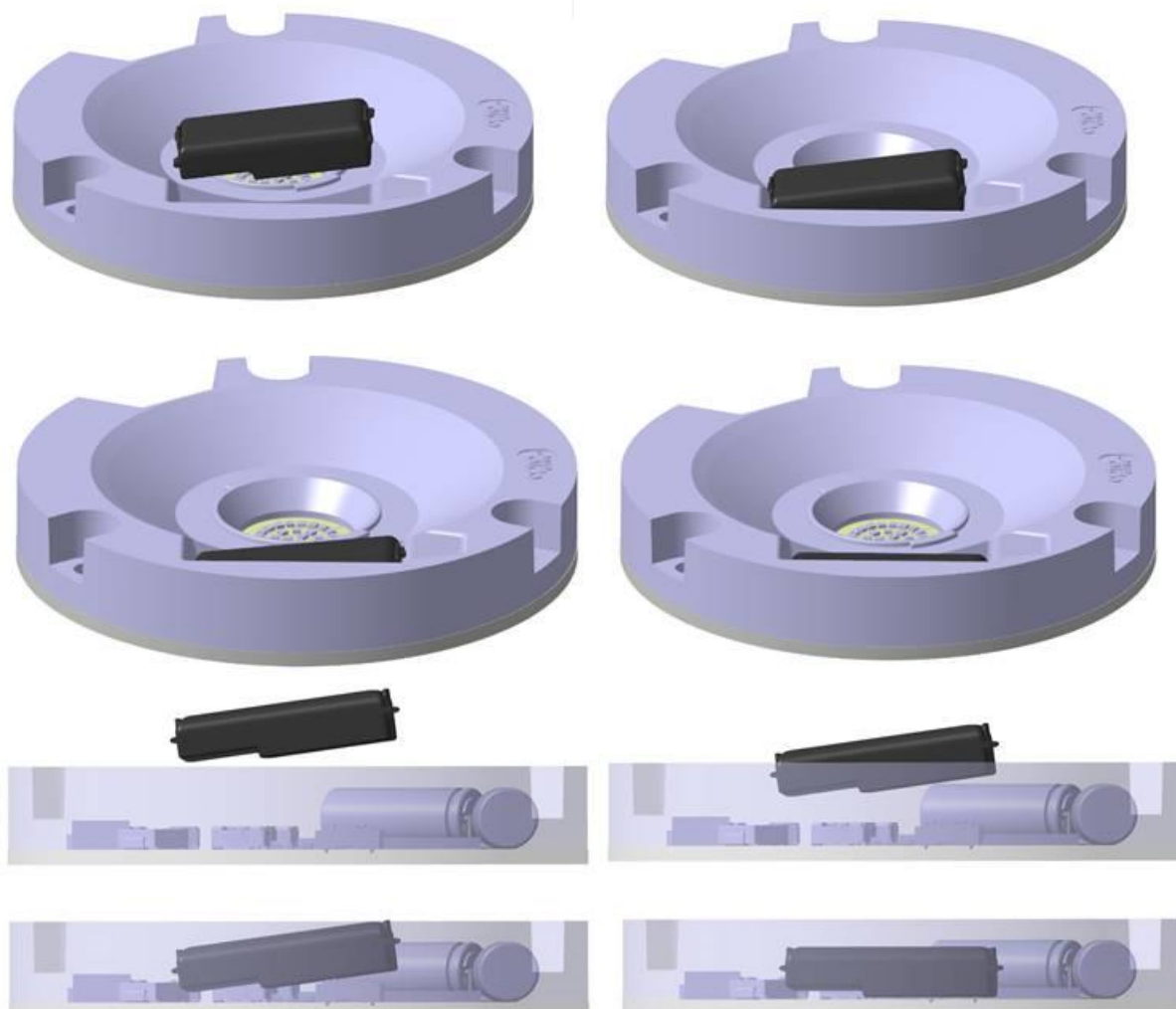
Momentary Switch (Switch DIM)



LED Module with IoT (DimIn Switch)



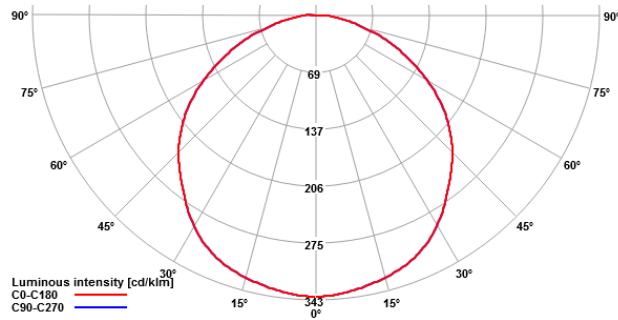
Mounting of DimIn



Here on the left, you can see the DimIn unit from below and you can see the connector that is connected to the LED module as well. It is important to insert the front first during assembly, as you can see in the pictures above, then press the rear end and the contact into place. Friction locking between the LED module's safety cover and the DimIn unit's protection locks it in place.

Optical data

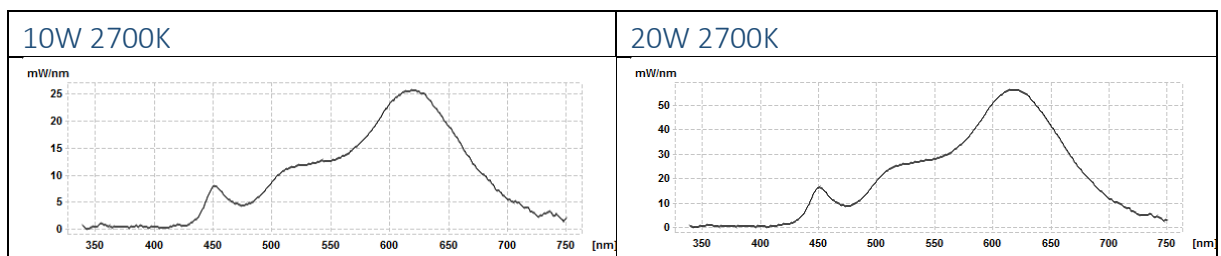
Light intensity distribution 20W version



Beam Angle

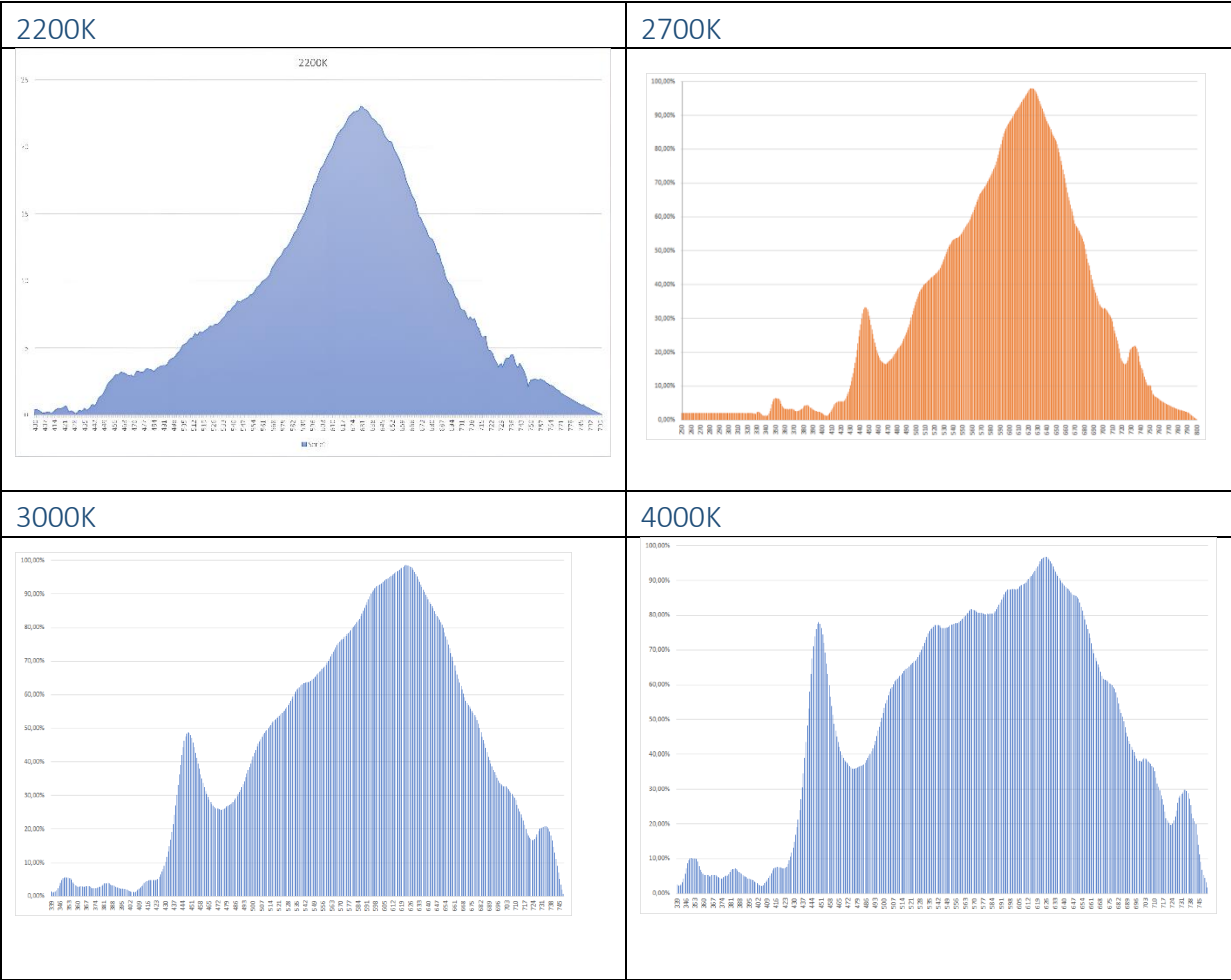
10W 2700K	20W 2700K
Beam angle 114.5° 0.5 1.555 1.0 3.109 3.0 9.328 4.0 12.43 5.0 15.54 Distance [m] Illuminance [lx] Diameter	Beam angle 115.1° 0.5 1.572 1.0 3.146 3.0 9.436 4.0 12.58 5.0 15.72 Distance [m] Illuminance [lx] Diameter

Spectrum

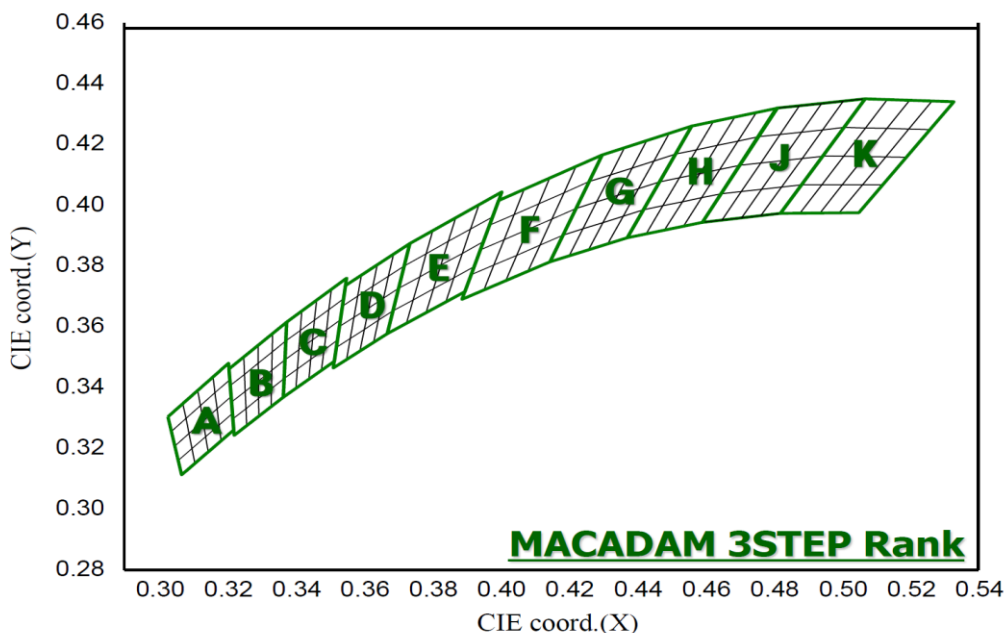




Colour Spectrum



CCT structure graphical representation



Short form in diagram	Colour Code	CCT
K	22	2200K
H	27	2700K
G	30	3000K
E	40	4000K

Colour Rendering Index (CRI)

CRI Code	CRI (min) Ra
8	>80
9	>90

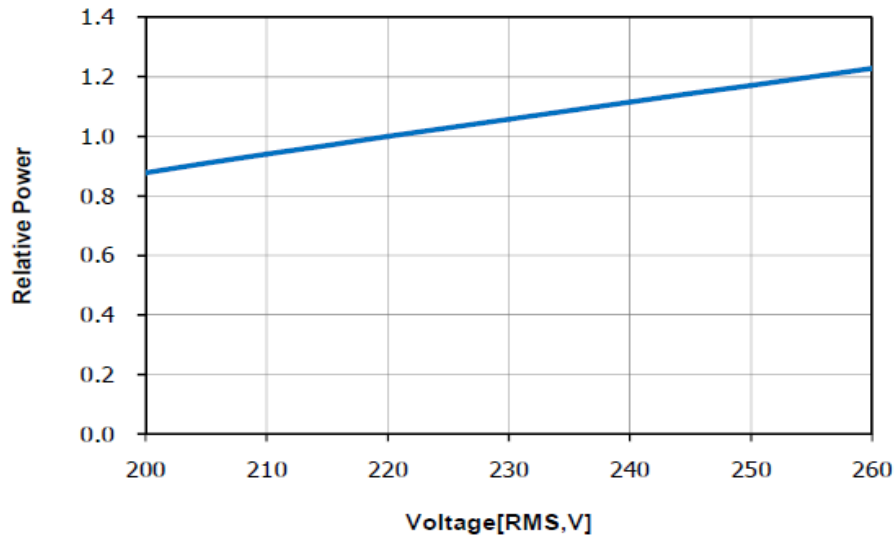
Short form letters for CCT (K)

Colour Code	CCT
22	2200K
27	2700K
30	3000K
40	4000K

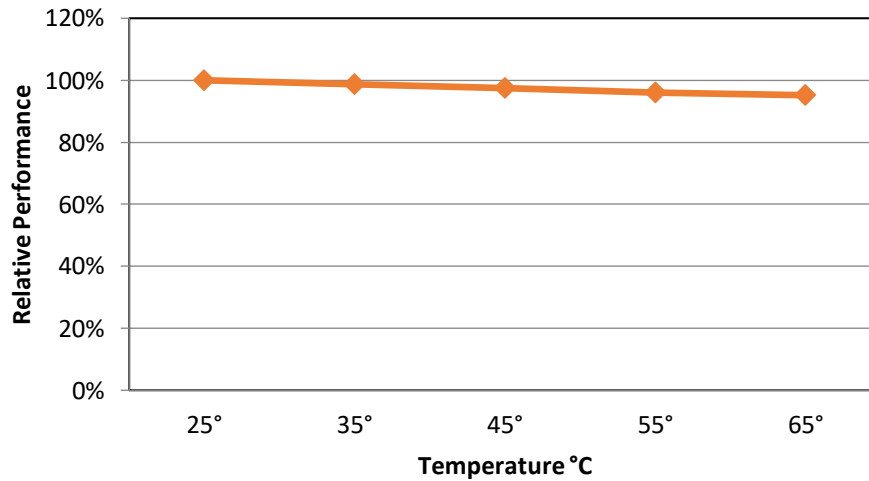
Electrical Optical Data

Current vs. Voltage

With increasing voltage the light output and the heat increases.



Temperature Characteristics



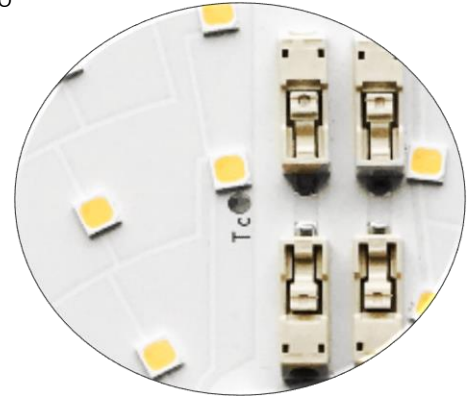
Consider the thermal capabilities of where the LED module is to be fitted. The temperature is an important factor for light output as well as for long time light output degradation.

Lifetime (Calculated)

Measurement points

When the measurement takes place you verify that the temperature on the marked measurement points is satisfying. Pending on the result you know what lifetime to expect from the module. This step will be implemented after the heat sink has been connected properly!

The lifetime is calculated at the maximum temperature recommended at the T_c (measuring point). It is important not to exceed this recommendation.



Measurement Control

The recommended maximum value is 85°C on T_c or measuring point. If this value is exceeded, we cannot guarantee the function and the lifetime of the product. The purpose of the measurement is to control the Junction (T_j) temperature of the LED and also in order to control the performance on the complete setup. By measuring the junction temperature (T_j) the average lifetime of the product is known.

Maximum Temperature

Secure the temperature in your application not to exceed 65°C. Read more in the section "Measurement control".

Projected lifetime based on TM-21

The power load used with the LED module is according to the "lumen maintenance projection". It is a LM80 projected lifetime based on discreet LEDs tested in the stated temperature environment at a 30mA power load.



Lifetime (Calculated)

The lifetime is calculated at the maximum temperature recommended at the T_c (measuring point). It is important not to exceed this recommendation; you find more information under the chapter “measurement control”.

Predicted light output based on LED lifetime (LM80) performance <u>ONLY</u>				
	55°C (T_c)	65°C (T_c)	75°C (T_c)	85°C (T_c)
L70	>50 000h	>50 000h	>50 000h	>50 000h
L80	>50 000h	>50 000h	>50 000h	>50 000h
L90	>50 000h	>50 000h	45 000h	37 000h



Verification of Conformity

The module are under testing at Intertek Semco according to IEC 62031.

Radio Disturbance	IEC 55015:2006 + A1:2007 + A2:2009	
SURGE	IEC 61000-4-5	1 kv
Fast transient BURST	IEC 61547	2 kv
SAFETY	IEC 62031:2008	
Photo Biological Safety	IEC 62471:2008	
Radio Disturbance	IEC 55015:2006 + A1:2007 + A2:2009	
EMC	IEC 61000-3-2:2006	
EMC	IEC 61000-3-3:2008	
ESD*	IEC 61000-4-2	8 kv Air discharge 4 kv Contact discharge

* Please consult the document ESD standards on Optodrive ED, ID and AC

Production Setup

Production in accordance with IPC-6012-B and IPC-A-600G class 2

The LED Module is in accordance to EU Directive 2002/95/EC(ROHS)

The bare PCB is isolation tested with 3000VDC/10mA for 10 seconds

PCB Material Setup

In all questions regarding the bare PCB please use "Material Data sheet Optodrive" as a guideline.



Light fitting routine tests

According to EN/IEC 60598-1 should the routine test be performed as a dielectric strength test or insulation test. Only the insulation test of 500Vdc should be performed according to standard, 1s with min 2MΩ.

No dielectric tests are allowed to be performed on OptoDrive LED Modules.

Precautions for use

- This device should not be used in any type of fluids such as water, oil, organic solvent etc.
- When cleaning is required, use only water together with mild soap on the outside of the lens. Cleaning inside of the LED module is strictly prohibited.
- The appearance and specifications of the product may be modified for improvement without notice.
- Long time exposure of sunlight or occasional UV exposure will cause lens discoloration.
- Opening of the LED module is prohibited due to risk of EMC, dust, grease and other exposures that will damage it.
- The LED Module should always be mounted to a proper heat sink before it's connected with its proper leads.

Handling in regards to static electricity

- The Optodrive products have integrated circuits (IC) on board that may be damaged if exposed to static electricity. Please handle the products only while using equipment that prevents static electricity. Do not handle them without having ESD protection.
- The Optodrive products are not be installed into the end product without proper ESD protection.
- Optodrive LED Modules meet IEC61547:2009 and IEC61000-4-2. We recommend the light fixture manufacturer to take the mentioned standards under consideration.

Storage before use

- Use only properly rated test equipment and tools for the rated voltage and current of the product being tested.
- It is strongly suggested to wear rubber insulated gloves and rubber bottom shoes while handling the product.
- Do not wear any conductive items (such as jewelry) which could accidentally contact electric circuits.
- Faults, lightning, or switching transients can cause voltage surges in excess of the normal ratings.
- Internal component failure can cause excessive voltages.
- Stored or residual electricity in long wire could be hazardous.



ROHS III Compliant

All our LED modules meet the Restrictions of Hazardous Substances (RoHS III)!

There has been a growing consensus that Lead Free Systems should increase for the safety of our environment. It is a very serious problem that lead and other harmful materials are being used in commercial and industrial products, causing more and more environmental problems. This has led to regulations such as RoHS (Restriction of the use of certain Hazardous Substances) from the EU and the Japan Ministry of Trade and Industry (MITI). All LED module makers providing products to these countries should comply with these restrictions. In order to meet the RoHS III regulation, Optoga is strictly implementing a ban on lead and other hazardous materials in its products. This is in compliance with our responsibilities as good corporate citizens.

Design for Environment:

According to the EU-directive (RoHS III) the following substances must not be used in this product

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Chromium VI (Cr⁶⁺)
- Polybrominated biphenyls PBB
- Polybrominated diphenyl ethers PBDE
- Bis(2-ethylhexyl) phthalate DEPH
- Butyl benzyl phthalate BBP
- Dibutyl phthalate DBP
- Diisobutyl phthalate DIBP

Do you want to know more about benefits of OptoDrive LED?

Read more about OptoDrive at www.optoga.com.

You can contact us via info@optoga.com.

You can also call us on +46 (0)589 490 950.

Optoga AB

Optoga was founded in November 2004 in Arboga, Sweden and has many years of experience in electronics design. The company develops and supplies LEDs and LED-module solutions for the lighting industry, vehicle manufacturers and electronics companies.

With the OptoDrive LED-module, Optoga has taken the initiative to replace strip lights, incandescent and halogen bulbs with LED-based sources.



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