eldoLED

The eldoLED compact LED drivers are designed for downlighting applications in Europe and rest of world. The plastic housing is designed to fit through small cut-outs (down to 45mm) and includes a strain relief.

The DALI-2 dimmable family includes an ECOdrive version (dimming to 1%), SOLOdrive versions (dimming to 0.1%, as well as a Dim-to-Warm version), and DUALdrive versions (Tunable White with 2 versions of DALI control, DT6, and DT8).

All products have an LEDcode2 interface for programming. The drivers with DALI-2 DT6 controls can be connected to an eldoLED Casambi-Ready BLE radio.

Applications

— Downlight
— Commercial (hospitality, office, healthcare)
— Residential

Key Features and Benefits

— Natural and flicker-safe dimming: Dim with smooth brightness changes, excellent flicker performance, configurable minimum dim level and adaptable dim curves. Hybrid HydraDrive technology is proven to work in TV studios and security camera environments
— Programmable: Fine tune your driver for any application across a wide operating window using FluxTool with LightShape. Programmable features vary per model and include:
  – Dimming level
  – Output current (1mA resolution)
  – Dimming curve
  – Dim to Warm using LightShape
  – Tunable White
— Control: supported control protocols include DALI-2 and LEDcode2 devices
— Performance: constant current SELV output to LEDs. European mains input (220-240VAC), low inrush current and total harmonic distortion. Can be used up to 50°C ambient temperature. Supports central battery (DC) emergency.

Specifications and Certifications

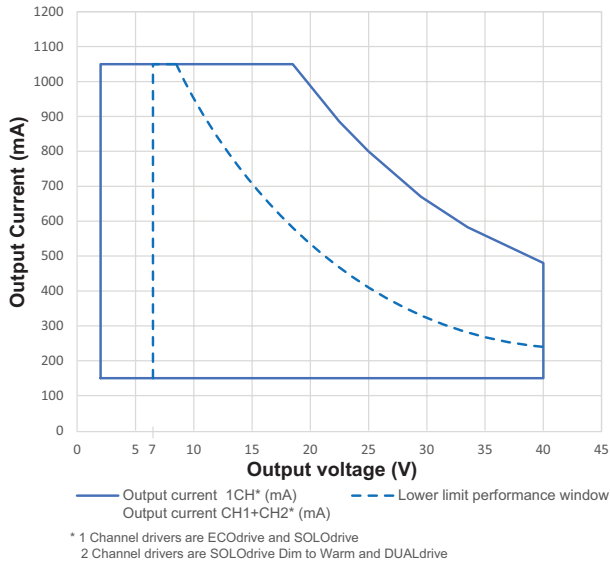CASAMBI • CE • DALI 2 • EL • EN 05 • LEDcode2 • RoHS compliant • UKCA

Products

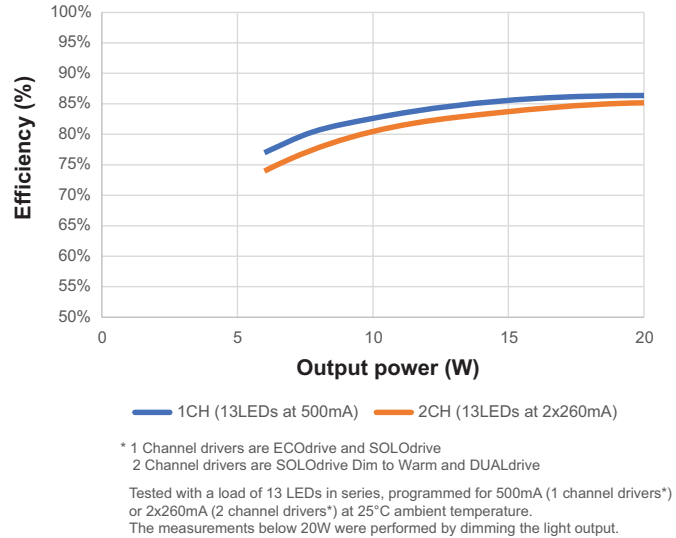| Product	Max Power	Dimming and Tunning	Output Current Range	Output Voltage Range	Control Protocol	LEDcode2	Order Number
ECOdrive	20W	Dim to 1%	150-1050 mA	2-40 V	DALI-2 DT6 Pulse dimming	Yes	EC 20CA E1Z0D
ECOdrive	20W	Dim to 1%	150-1050 mA	2-40 V	0-10V	Yes	EC 20CA E1Z0A
SOLOdrive	20W	Dim to 0.1%	150-1050 mA	2-40 V	DALI-2 DT6 Pulse dimming	Yes	SL 20CA E1Z0D
SOLOdrive	20W	Dim to 0.1%	150-1050 mA	2-40 V	0-10V	Yes	SL 20CA E1Z0A
SOLOdrive	20W	Dim to Warm	150-1050 mA	2-40 V	DALI-2 DT6	Yes	SL 20CA E2Z0D
DUALdrive	20W	Tunable White	150-1050 mA	2-40 V	DALI-2 DT6	Yes	DL 20CA E2Z0D
DUALdrive	20W	Tunable White	150-1050 mA	2-40 V	DALI-2 DT8	Yes	DL 20CA E2Z0C

Electrical Specifications

Max Output Power	Nominal Input Voltage	Max Input Current	Typ. Power Factor at Full Load	Typ. THD at Full Load	Typ. Max Standby Power	Inrush, Max on Circuit Breaker	Surge Protection	Typ. Efficiency at Full Load	Typ. Max Tc
20W	220-240VAC 176-250VDC	0.15A @ 230VAC	>0.95	<20%	<0.5W	106 on B16 106 on C16	2kV (differential) 2kV (common)	82%	85°C

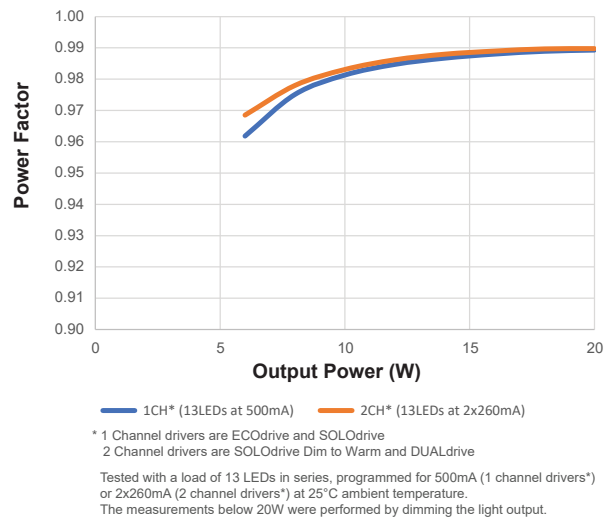## Operating Window

Output current 1CH* (mA)
Output current CH1+CH2* (mA)
Lower limit performance window

* 1 Channel drivers are ECOdrive and SOLOdrive
2 Channel drivers are SOLOdrive Dim to Warm and DUALdrive

Typical Efficiency vs Load

1CH (13LEDs at 500mA)   2CH (13LEDs at 2x260mA)

* 1 Channel drivers are ECOdrive and SOLOdrive
2 Channel drivers are SOLOdrive Dim to Warm and DUALdrive

Tested with a load of 13 LEDs in series, programmed for 500mA (1 channel drivers*)
or 2x260mA (2 channel drivers*) at 25°C ambient temperature.
The measurements below 20W were performed by dimming the light output.

Typical THD vs Load

1CH* (13LEDs at 500mA)   2CH* (13LEDs at 2x260mA)

* 1 Channel drivers are ECOdrive and SOLOdrive
2 Channel drivers are SOLOdrive Dim to Warm and DUALdrive

Tested with a load of 13 LEDs in series, programmed for 500mA (1 channel drivers*)
or 2x260mA (2 channel drivers*) at 25°C ambient temperature.
The measurements below 20W were performed by dimming the light output.

Power Factor

1CH* (13LEDs at 500mA)   2CH* (13LEDs at 2x260mA)

* 1 Channel drivers are ECOdrive and SOLOdrive
2 Channel drivers are SOLOdrive Dim to Warm and DUALdrive

Tested with a load of 13 LEDs in series, programmed for 500mA (1 channel drivers*)
or 2x260mA (2 channel drivers*) at 25°C ambient temperature.
The measurements below 20W were performed by dimming the light output.

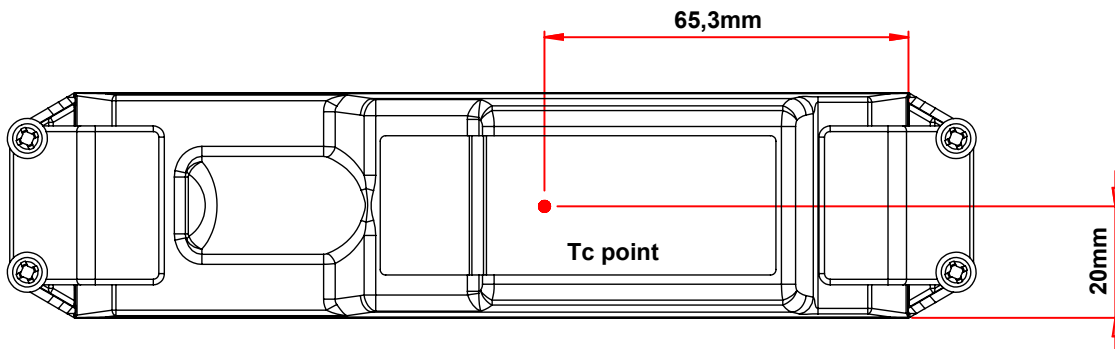## Minimum and Maximum Ratings

Parameter	Values
Input Voltage Range	196-264VAC and176-250VDC
Ambient Operating Temperature	-20°C to 50°C
Lifetime	50,000 hours at maximum case temperature (Tc)

Tc Point Location

ECOdrive, SOLOdrive 1 channel

55,10mm

21mm

Tc point

DUALdrive, SOLOdrive 2 channels

65,3mm

Tc point

20mm
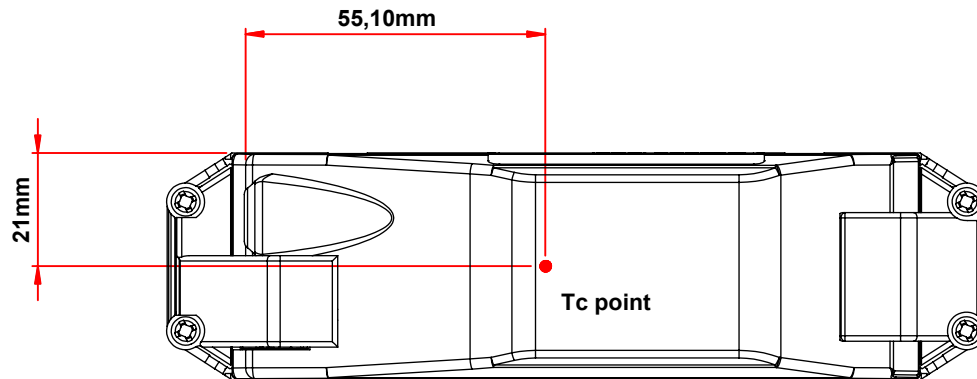
Programming Tools

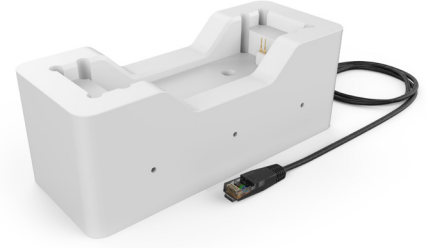|	
Programming Software	FluxTool 4.6.9 or higher
Programming Interface: Toolbox pro	TLU20505
Toolbox Adapter	TLA20502
Programming Cable	TLC03051
Handheld Programming Tool	PJ0035HH1
Programming Jig	PJ0200A1

Programming Interface
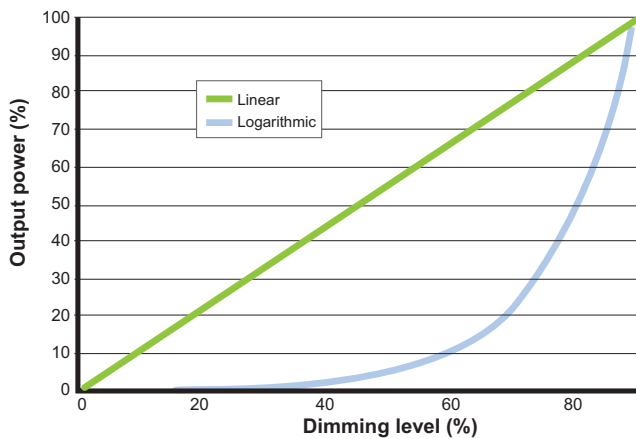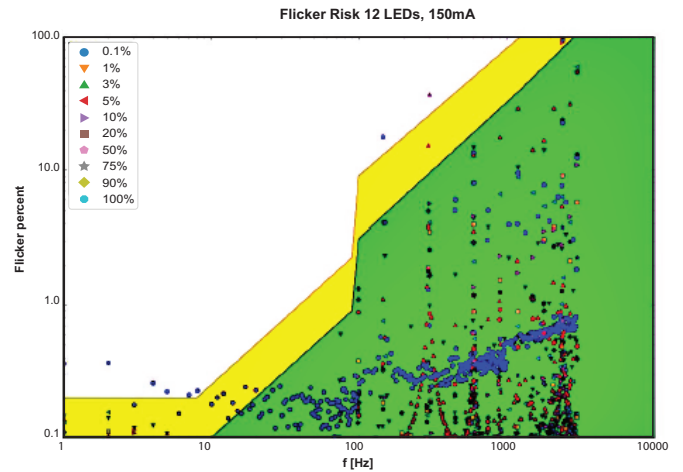

Handheld Tool

Typical Jig

Programming Parameters

LED Output Current	1 mA resolution
Dimming Curve	LOG - Logarithmic (default)
	LIN - Linear
	SLN - Soft-linear (0-10V model only)
	SQU - Square (0-10V model only)
Minimum Dim Level	Settable in 0.1% increments down to 1% (ECOdrive) or 0.1% (DUALdrive, SOLOdrive)

Dimming Curves

Flicker Performance*

Flicker Risk 12 LEDs, 150mA

* 0.1% data are not applicable for ECOdrive range

Ordering Guide

EC	20	CA	E	1	Z0	D
Family	**Output Wattage**	**Housing**	**Input Voltage**	**Output Channels**	**AUX Voltage**	**Control**
EC = ECOdrive	20W	C = Compact	E = 220-240VAC	1 = 1 Output	Z0 = No AUX Output	D = DALI DT6
SL = SOLOdrive		A = With Strain Relief		2 = 2 Outputs		C = DALI DT8
DL = DUALdrive						A = 0-10V

Wiring and Connector Lay Out

	Input	Output
Connector Type	Screw terminal TE 2-796683	Push in terminal Wago 250
Wire Type	Solid or stranded copper	Solid or stranded copper
Wire Dimensions	0.5-3mm2 / AWG 20-12	0.5-1.5mm2 / AWG 20-16
Wire Strip Length	9.0mm	9.0mm
Maximum Length To Fixture		2m for independent use

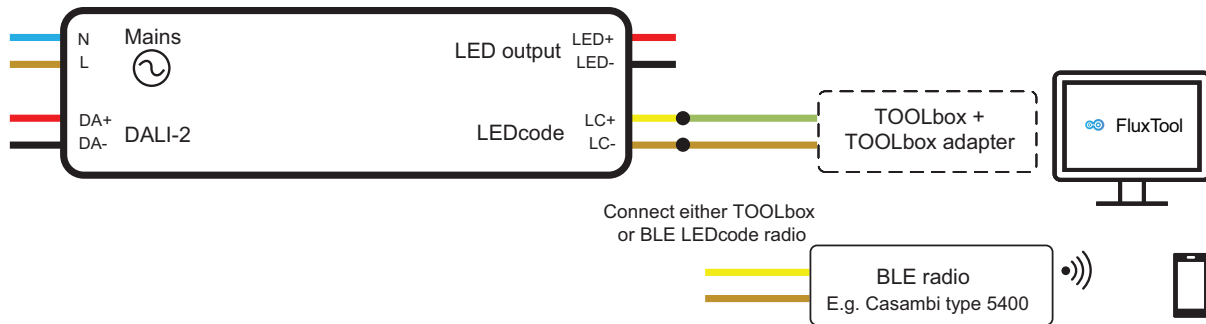## Connector Lay Out

ECOdrive, SOLOdrive 1 channel

L +		LED output +
N -		LED output -
0-10V +/DALI +		LEDcode/NTC +
0-10V -/DALI -		LEDcode/NTC -

DUALdrive, SOLOdrive 2 channels

L +		LED output 1 +
N -		LED output 1 -
DALI +		LED output 2 +
DALI -		LED output 2 -
		LEDcode/NTC +
		LEDcode/NTC -

Wiring Diagram

ECOdrive, SOLOdrive 1 channel

N L Mains
DA+ DA- DALI-2
LED output LED+ LED-
LEDcode LC+ LC-
TOOLbox + TOOLbox adapter
FluxTool

Connect either TOOLbox
or BLE LEDcode radio

BLE radio
E.g. Casambi type 5400

DUALdrive, SOLOdrive 2 channels

N L Mains
DA+ DA- DALI-2
LED output LED1+ LED1- LED2+ LED2-
LEDcode LC+ LC-
TOOLbox + TOOLbox adapter
FluxTool

Connect either TOOLbox
or BLE LEDcode radio

BLE radio
E.g. Casambi type 5403
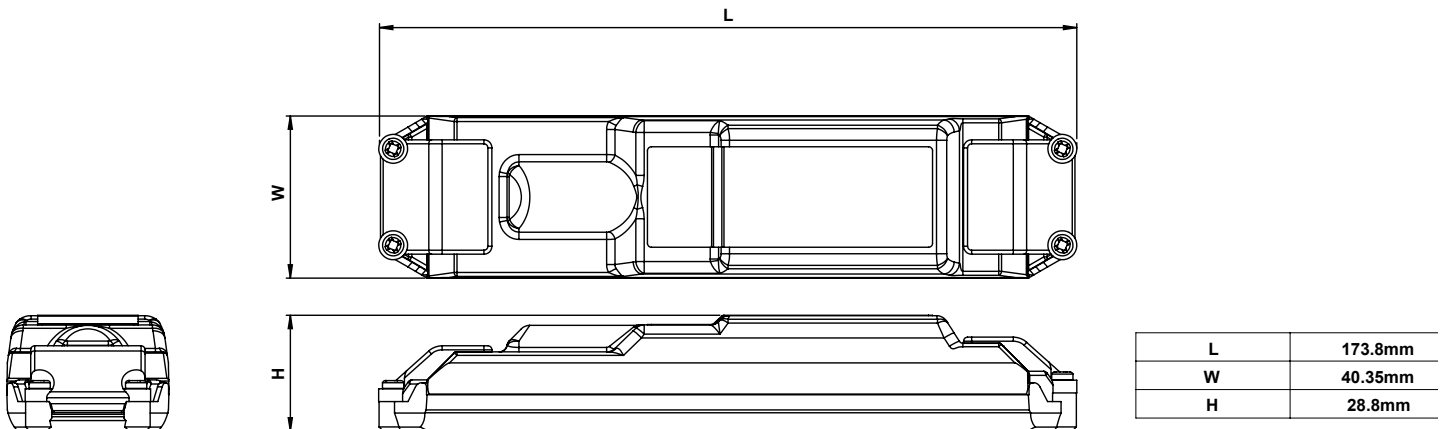
Compact Stand-alone Family - Datasheet

Mechanical Details	ECOdrive, SOLOdrive 1 channel	DUALdrive, SOLOdrive 2 channels
Length x Width x Height	150.5 x 42.1 x 27.9mm	173.85 x 40.35 x 28.8mm
Weight of individual product	105g	115g
Packaging	50 pcs per box	50 pcs per box
Box Weight	6.7kg	7kg
Box Dimensions	579 x 237 x 202mm	579 x 237 x 202mm

ECOdrive, SOLOdrive 1 channel

L	150.5mm
W	42.1mm
H	27.9mm

DUALdrive, SOLOdrive 2 channels

L	173.8mm
W	40.35mm
H	28.8mm

LED Driver Protection

Thermal	The LED output current is automatically decreased whenever the internal driver temperature exceeds a factory preset temperature. The LED output current is increased once the internal driver temperature drops below the preset temperature threshold. If the internal driver temperature continues to increase, despite a decrease in output current, the LED driver will eventually shut down.
LED Output Short Circuit	The LED output current is cut off whenever the LED driver detects a shortcircuit. The LED driver will attempt a restart every 400ms after a short-circuit is detected.
LED Output Open Circuit	The LED output is turned off whenever the LED driver detects an open circuit. The LED driver will attempt a restart every 400ms after an open circuit is detected.
LED Output Overload	The driver monitors the LED output load. Whenever the output load exceeds the maximum output power rating of the LED driver, the output current is sequentially scaled down until the cumulative load drops below the maximum output power rating of the LED driver.
Reverse Polarity	The LED driver will not yield any current if the polarity of the load on the LED output is reversed. This situation will not damage the LED driver but may damage the LED load.

LED Protection

Thermal Protection LED	An external NTC thermistor, which is placed on a PCB near the LEDs, can be connected to the driver via the LEDcode/NTC terminals. The output current to the LEDs is then decreased by 75% whenever the NTC exceeds a maximum allowable temperature, which is specified by the user in the FluxTool software. The default NTC temperature limit is set to 70°C.
Thermistor Value	47kΩ
Suitable Thermistors	leaded:Vishay, P/N 238164063473 screw:Vishay, P/N NTCASCWE3473J

Standards and Compliance

ENEC safety	EN 61347-1 EN 61347-2-13 (Emergency lighting)
ENEC performance	EN 62384
Conducted emissions	EN 55015
Radiated emissions	EN 55015
Radio disturbance characteristics	EN 66022
Harmonic current emissions	EN 61000-3-2
Electrostatic discharge	EN 61000-4-2
RFE field susceptibility	EN 61000-4-3
Electrical fast transient	EN 61000-4-4
Surge immunity	EN 61000-4-5
Conducted radio frequency	EN 61000-4-6
Voltage dips	EN61000-4-11
Electromagnetic immunity	EN 61547
ECOdesign 2019/2020	Flicker for LED: Pst LM ≤ 1.0 at full load Stroboscopic effect for LED: SVM ≤ 0.4 at full load
DALI-2	IEC 62386-101 Edition 2.0, IEC 62386-102 Edition 2.0, IEC 62386-207 Edition 1
0-10V	IEC/EN 60929 annex E NOTE: From 0.6V to 10V eldoLED LED drivers comply with IEC/EN 30929 annex E. Below 0.6V eldoLED LED drivers comply with ABL 0-10V Design Spec v1.2 enabling standby mode. For detailed dimming characteristics see 0-10V response chart in Control Characteristics.
Surge protection	IEC 61000-4-5 level3: 2kV DM, 2kV CM @ 2Om
Restriction of hazardous substance	RoHS3 (Directives 2011/65/EU-2015/863/EU)
SVHC-list substances	REACH Art 33

Safety

⚠	Risk of electrical shock. May result in serious injury or death. Disconnect power before servicing or installing.
⚠	The LED driver may only be connected and installed by a qualified electrician. All applicable regulations,legislation, and building codes must be observed. Incorrect installation of the LED driver can cause irreparable damage to the LED driver and the connected LEDs. Pay attention when connecting the LEDs: polarity reversal results in no light output and often damages the LEDs.
⚠	LED drivers are designed and intended to operate LED loads only. Powering non-LED loads may push the LED driver outside its specified design limits and is, therefore, not covered by any warranty.
ⓘ	eldoLED products are designed to meet the performance specifications as outlined at certain operating conditions in the datasheet. It is the responsibility of the fixture manufacturer to test and validate the design and operation of the system under expected and potential use cases, including faults.
ⓘ	Please observe voltage drop over long cable lengths. Longer cable lengths increase EMI susceptibility.
ⓘ	Product renderings and dimensional drawings are generic for the housing type. Product label, connector type and quantity may vary.

Warranty

eldoLED LED Drivers are covered by a 5-year limited warranty.
Complete warranty terms can be found at: eldoled.com/legal/terms-and-conditions

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