



20W 0-10V LED Driver with Smooth Dimming to 1%

ECOdrive

Programmable digital ECOdrive LED driver providing standard LED fixtures with the smoothest flicker-free dimming to 1% light output, delivering value to any application. The LED driver is compatible with the 0-10V lighting control protocol, and works seamlessly together with LED modules, controls and intelligent luminaire elements.

Product offering



ECOdrive 20MA-E1Z0A

| | |
|---------------------|---|
| Part number (P/N) | EC20MA-E1Z0A1 |
| Product description | ECOdrive, 20W, 0-10V, 1 control channel, constant current, 1x 40V output, side feed, long plastic |

ECOdrive 20MA-E1Z0A (Single Package Option)

| | |
|---------------------|--|
| Part number (P/N) | EC20MA-E1Z0A1-SP |
| Product description | ECOdrive, 20W, 0-10V, 1 control channel, constant current, 1x 40V output, side feed, long plastic, single unit packaging |

Features & benefits

| | |
|------------------------------|---|
| Natural dimming | Dim to 1%, smooth brightness changes, excellent flicker performance, adaptable dimming curves, configurable minimum dimming level |
| Ceiling cut-out requirements | LED driver fits through ceiling cut-out diameter of 45mm for recessed downlight luminaires |
| LEDcode | Configurable design to work with most constant current LED modules and arrays, while providing a connection point to integrated peripheral controls |
| Programmable | Fine-tune your driver for any application |
| Performance | Low inrush current and total harmonic distortion (THD), high power factor and efficiency |
| Camera compatibility | Hybrid HydraDrive technology is proven to work in TV studios and security camera environments |

Programming tools

| | |
|-------------------------------------|---|
| Programming interface | TOOLbox pro (TLU20504) |
| Programming cable set | TOOLbox pro to LED driver, programming cable, 5pcs (TLC03051) |
| Programming Hand-held, Touch-and-Go | PJ0035HH1 |
| Programming jig | PJ0200A1 |
| Programming software | FluxTool |

Warranty

| | |
|-----------------|--|
| Warranty period | General Terms and Conditions |
|-----------------|--|

Order number configurator

EC20MA-E1Z0A1

Part Number

mA

LED Output Current

Dimming Curve

. min

Minimum Dimming Level

| | |
|-----------------------|---|
| P/N | LED driver part number |
| LED output current | Enter value in 1mA increments, e.g. "811" for 811mA |
| Dimming curve | "LOG" for logarithmic (default) "LIN" for linear "SLN" for soft-linear "SQU" for square |
| Minimum dimming level | Leave blank for default minimum dimming level of 1.0%. Specify in 0.1% increments, e.g. "10.5" for 10.5%. |

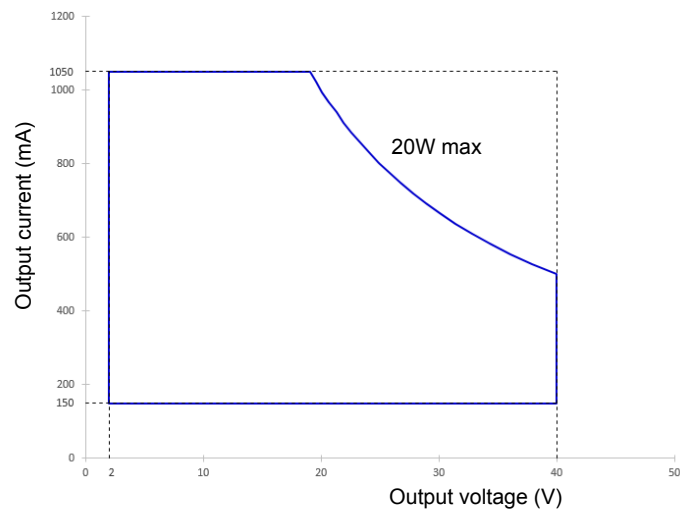
Input characteristics

| | |
|------------------------------|--|
| Nominal input voltage range | 220 - 240 VAC (ENEC) 176 - 250 VDC |
| Absolute input voltage range | 198 - 264 VAC |
| Input frequency range | 50 - 60 Hz |
| Maximum input current | 0.15A @ 230 VAC |
| Efficiency at full load | 80% |
| Power factor at full load | > 0.95 |
| THD at full load | < 20% |
| Maximum inrush current | < 200mA ² s @ 230 VAC |
| Surge protection | 2kV differential mode (DM) 2kV common mode (CM) |
| Maximum standby power | < 0.5W |

Output characteristics

| | |
|---------------------------------------|---|
| Maximum LED output power | 20W |
| Number of LED outputs | 1 |
| Programmable LED output current range | 150 - 1050mA |
| LED output type | Programmable in 1mA increments within specified current range |
| LED output current tolerance | +/- 5% at programmed LED output current |
| LED output voltage range | 2 - 40V |

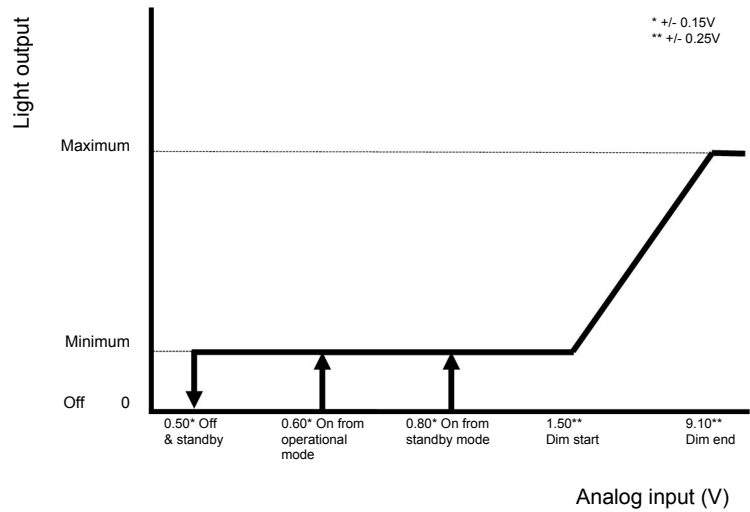
Operating window



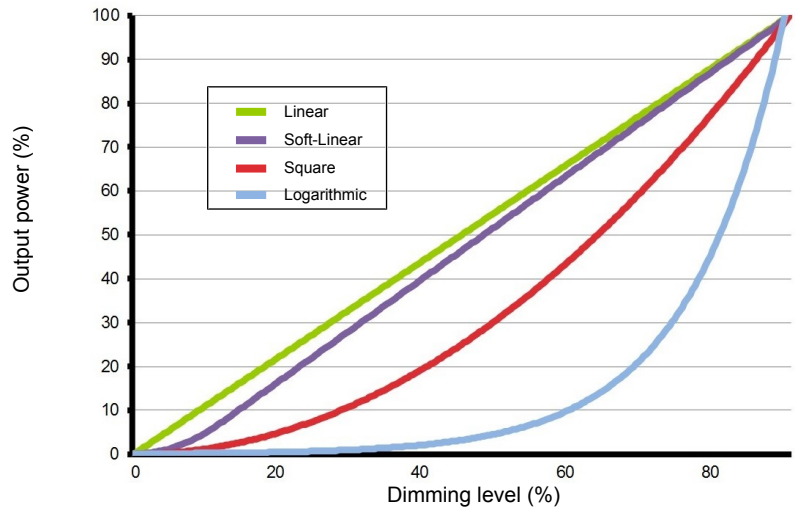
Control characteristics

| | |
|-----------------------|--|
| Control channels | 1 |
| Control protocol | 0-10V |
| | LEDcode |
| Dimming range | 100% - 1% |
| Dimming curve options | Logarithmic (default) Linear Soft-Linear Square |
| Dimming method | Hybrid HydraDrive |
| 0-10V current draw | 0.6mA |
| Time delay to standby | < 60s |

0-10V dimming chart



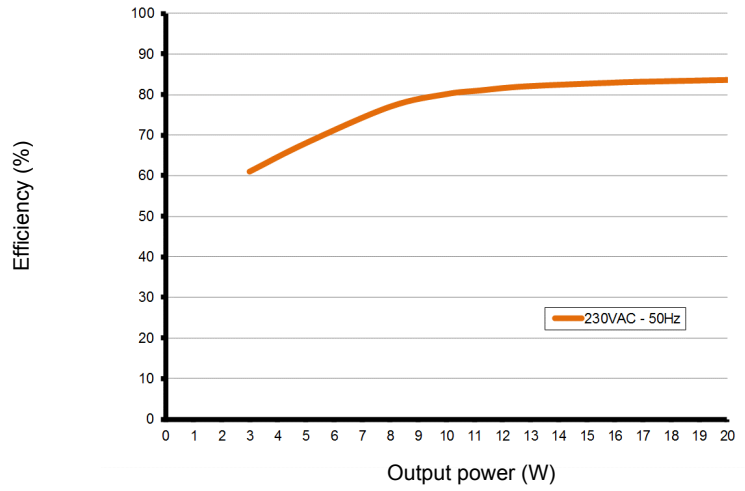
Dimming curves



Performance

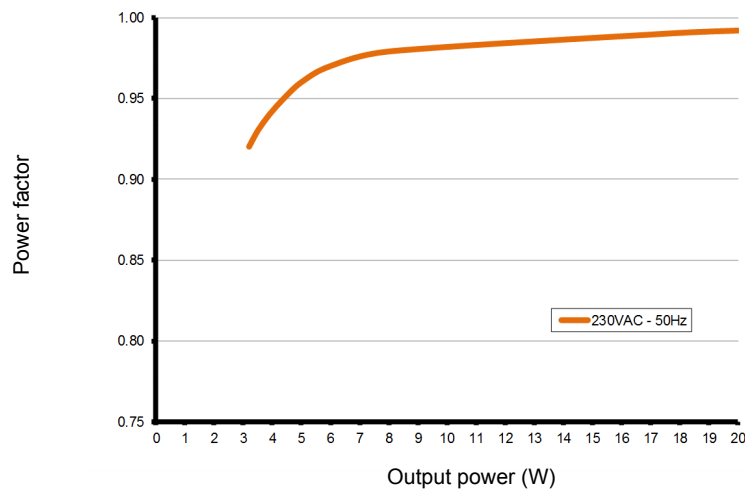
Typical efficiency vs load

Tested with a load of 12 LEDs in series, programmed for 500mA and at 25 °C ambient temperature. The measurements below 20W were performed by dimming the light output.



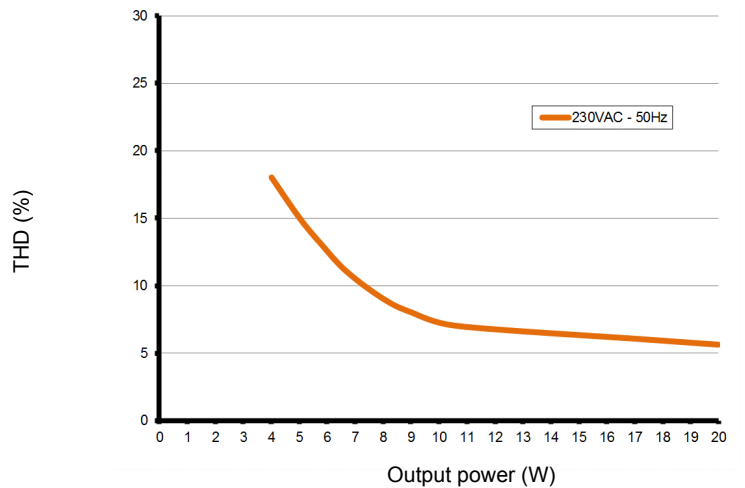
Typical power factor vs load

Tested with a load of 12 LEDs in series, programmed for 500mA and at 25 °C ambient temperature. The measurements below 20W were performed by dimming the light output.



Typical THD vs load

Tested with a load of 12 LEDs in series, programmed for 500mA and at 25 °C ambient temperature. The measurements below 20W were performed by dimming the light output.



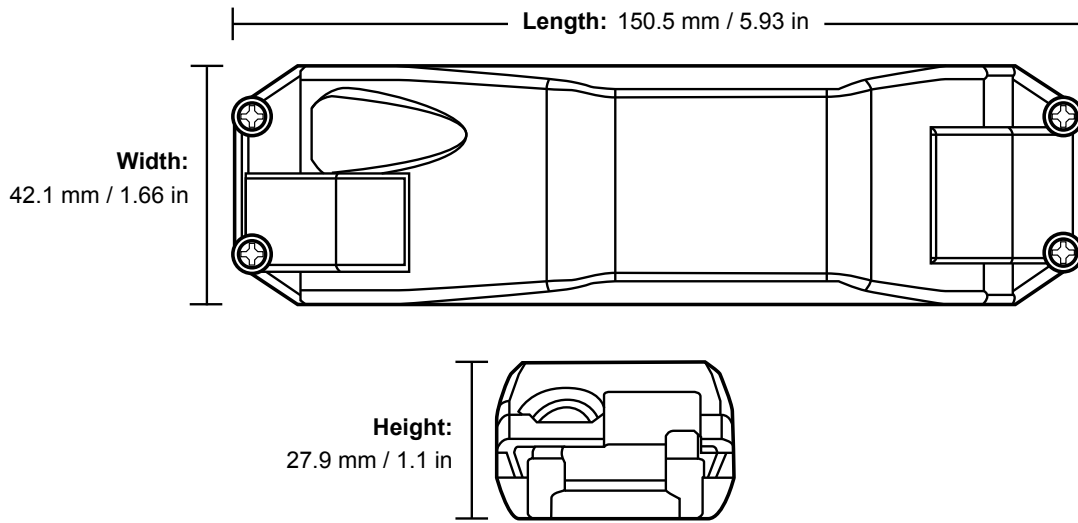
LED driver protection

| | |
|--------------------------|---|
| 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 short-circuit. 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 |

LED driver mechanical details



Weight 100 g

3D Mechanical files for this product are available on the eldoLED website.

Packaging

Length x Width x Height 579 x 237 x 202 mm / 22.8 x 9.33 x 7.95 in

Weight (including products) 10.5 kg

Products per box 50 pcs

Connector layout



Input wiring specifications

| | |
|-------------------------------|--------------------------------------|
| Connector type | screw terminals |
| Connector supplier and series | TE-Connectivity 2-796683 |
| Wire type | solid or stranded copper |
| Wire core cross section | 0.5 - 3mm ² / AWG 20 – 12 |
| Wire strip length | 9.0mm (11/32in) |
| Input-cable shape | Round |

Output wiring specifications

| | |
|--|--|
| Connector type | push-in terminals |
| Connector supplier and series | Wago 250 series |
| Wire type | solid or stranded copper |
| Wire core cross section | 0.5 - 1.5mm ² / AWG 20 – 16 |
| Wire strip length | 9.0mm (11/32in) |
| Output-cable shape | Round |
| Maximum remote mounting distance of LED load | For independent use: 2 m / 6.5 ft For in-fixture use: AWG 20 (0.52 mm ²) - 14 m / 46 ft AWG 19 (0.65 mm ²) - 18 m / 59 ft AWG 18 (0.82 mm ²) - 22 m / 72 ft AWG 17 (1.04 mm ²) - 28 m / 92 ft AWG 16 (1.31 mm ²) - 36 m / 118 ft |

Automatic circuit breakers (MCB)

| | | | | | | | |
|-----------------|-----------------------|-----|-----|-----|-----|-----|-----|
| Maximum loading | MCB type | B10 | B13 | B16 | C10 | C13 | C16 |
| | Number of LED drivers | 66 | 86 | 106 | 66 | 86 | 106 |

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 55022 |
| 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 | EN 61000-4-11 |
| Electromagnetic immunity | EN 61547 |
| ECODesign 2019/2020: Controlgear + luminaire | Flicker for LED: Pst LM ≤ 1.0 at full-load Stroboscopic effect for LED: SVM ≤ 0.4 at full load |
| 0-10V | IEC/EN 60929 annex E NOTE: From 0.6V to 10V eldoLED LED drivers comply with IEC/EN 60929 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. |
| Restriction of hazardous substances | RoHS3 (Directives 2011/65/EU-2015/863/EU) |
| SVHC-list substances | REACH Art.33 |

Certifications



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 data sheet. 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.

Europe, Rest of World

eldoLED B.V.
Science Park Eindhoven 5125
5692 ED Son
The Netherlands

E: info@eldoled.com
W: www.eldoled.com

North America

eldoLED America
One Lithonia Way
Conyers, GA 30012
USA

E: info@eldoled.com
W: www.eldoled.com
