

Features

- High Efficiency (Up to 91%)
- Full Power at 50-100% Max Current (Constant Power)
- DALI Dimmable
- Dim-to-Off with Standby Power ≤ 1 W
- Input Surge Protection: DM 4kV, CM 6kV
- All-Around Protection: OVP, SCP, OTP
- IP67
- SELV Output



Description

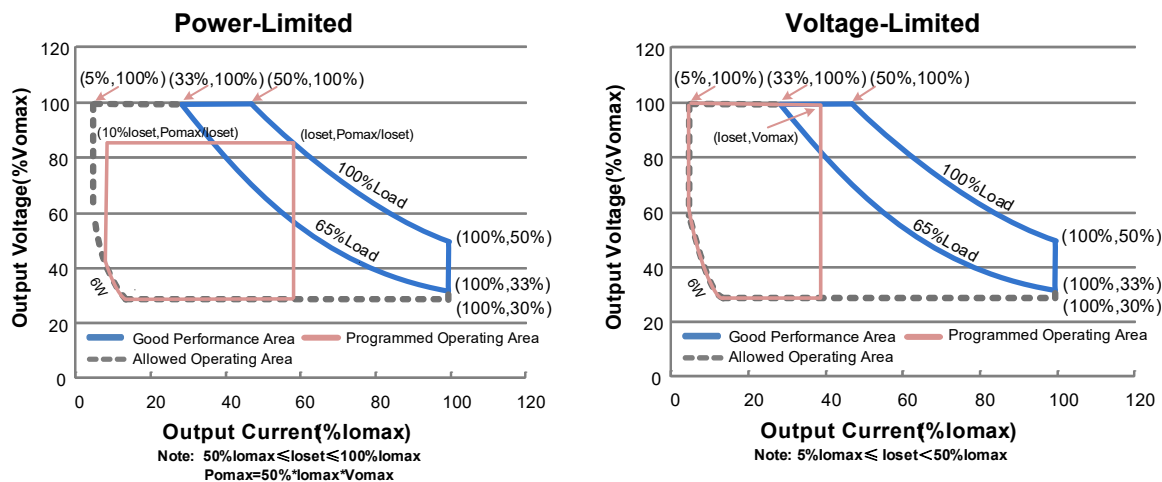
The EUD-096SxxxBV series is a 96W, constant-current, programmable LED driver that operates from 90-305 Vac input with excellent power factor. Created for many lighting applications including low bay, tunnel and street, etc. it provides a dim-to-off mode with low standby power. The high efficiency of these drivers and compact metal case enables them to run cooler, significantly improving reliability and extending product life. To ensure trouble-free operation, protection is provided against input surge, output over voltage, short circuit, and over temperature.

Models

Output Current Range	Full-Power Current Range (1)	Default Output Current	Input Voltage Range(2)	Output Voltage Range	Max. Output Power	Typical Efficiency (3)	Typical Power Factor		Model Number
							120Vac	220Vac	
45-900mA	450-900mA	700 mA	90~305 Vac/ 127~250 Vdc	64~214Vdc	96 W	91.0%	0.99	0.96	EUD-096S090BV
90-1800mA	900-1800mA	1050 mA	90~305 Vac/ 127~250 Vdc	32~107Vdc	96 W	90.5%	0.99	0.96	EUD-096S180BV ⁽⁴⁾
180-3600mA	1800-3600mA	2100 mA	90~305 Vac/ 127~250 Vdc	16 ~ 53Vdc	96 W	90.0%	0.99	0.96	EUD-096S360BV ⁽⁴⁾

- Notes:** (1) Output current range with constant power at 96W
 (2) Certified input voltage range: 100-240Vac or 127-250Vdc
 (3) Measured at a 220 Vac input with 50% maximum output current and 100% maximum output voltage.
 (4) SELV Output

I-V Operating Area



Input Specifications

Parameter	Min.	Typ.	Max.	Notes
Input AC Voltage	90 Vac	-	305 Vac	
Input DC Voltage	127 Vdc	-	250 Vdc	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.70 mA	IEC60598-1; 240Vac/ 60Hz
Input AC Current	-	-	1.3 A	Measured at 100% load and 100 Vac input.
	-	-	0.6 A	Measured at 100% load and 220 Vac input.
Inrush Current(I^2t)	-	-	2.4 A ² s	At 220Vac input, 25°C Cold Start, Duration=1.0 ms, 10%Ipk-10%Ipk. See Inrush Current Waveform for the details.
PF	0.90	-	-	At 100-277Vac, 50-60Hz, 65%-100% Load (63-96W)
THD	-	-	20%	

Output Specifications

Parameter	Min.	Typ.	Max.	Notes
Output Current Tolerance	-5%I _{oset}	-	5%I _{oset}	At 100% load condition
Output Current Setting(I _{oset}) Range	5%I _{omax}	-	100%I _{omax}	
Output Current Setting Range with Constant Power	50%I _{omax}	-	100%I _{omax}	
Total Output Current Ripple (pk-pk)	-	5%I _{omax}	10%I _{omax}	At 100% load condition, 20 MHz BW
Output Current Ripple at < 200 Hz (pk-pk)	-	1%I _{omax}	-	At 100% load condition. Only this component of ripple is associated with visible flicker.
Startup Overshoot Current	-	-	10%I _{omax}	At 100% load condition

Output Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
No-load Output Voltage				
EUD-096S090BV	-	-	240 V	
EUD-096S180BV	-	-	119 V	
EUD-096S360BV	-	-	59.5 V	
Line Regulation	-	-	±0.5%	Measured at 100% load
Load Regulation	-	-	±1.5%	
Turn-on Delay Time	-	0.8 s	1.5 s	Measured at 120Vac and 220Vac input. 65%-100% Load
Temperature Coefficient of Isot	-	0.03%/°C	-	Case temperature = 0°C ~Tc max

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120 Vac input:				
EUD-096S090BV				
Io=450 mA	85.5%	88.5%	-	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Io=900 mA	84.5%	87.5%	-	
EUD-096S180BV				
Io=900 mA	85.0%	88.0%	-	
Io=1800mA	84.0%	87.0%	-	
EUD-096S360BV				
Io=1800mA	84.5%	87.5%	-	
Io=3600mA	83.0%	86.0%	-	
Efficiency at 220 Vac input:				
EUD-096S090BV				
Io=450 mA	89.0%	91.0%	-	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Io=900 mA	88.0%	90.0%	-	
EUD-096S180BV				
Io=900 mA	88.5%	90.5%	-	
Io=1800mA	87.5%	89.5%	-	
EUD-096S360BV				
Io=1800mA	88.0%	90.0%	-	
Io=3600mA	86.5%	88.5%	-	
Efficiency at 277 Vac input:				
EUD-096S090BV				
Io=450 mA	89.5%	91.5%	-	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Io=900 mA	88.5%	90.5%	-	
EUD-096S180BV				
Io=900 mA	89.0%	91.0%	-	
Io=1800mA	88.0%	90.0%	-	
EUD-096S360BV				
Io=1800mA	88.5%	90.5%	-	
Io=3600mA	87.0%	89.0%	-	
Standby power	-	-	1 W	Measured at 230Vac/50Hz; Dimming off
MTBF	-	212,000 Hours	-	Measured at 220Vac input, 80%Load and 25°C ambient temperature (MIL-HDBK-217F)
Lifetime	-	111,000 Hours	-	Measured at 220Vac input, 80%Load and 60°C case temperature; See lifetime vs. Tc curve for the details

General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Operating Case Temperature for Safety T _{cs}	-40°C	-	+90°C	
Operating Case Temperature for Warranty T _{cw}	-40°C	-	+70°C	Humidity: 10%RH to 95%RH
Storage Temperature	-40°C	-	+85°C	Humidity: 5%RH to 95%RH
Dimensions Inches (L × W × H) Millimeters (L × W × H)	7.64 × 2.66 × 1.44 194 × 67.5 × 36.5			With mounting ear 8.70 × 2.66 × 1.44 221 × 67.5 × 36.5
Net Weight	-	985 g	-	

Dimming Specifications

Parameter	Min.	Typ.	Max.	Notes
DA1,DA2 High Level	9.5V	16V	22.5V	
DA1,DA2 Low Level	-6.5V	0V	6.5V	
DA1,DA2 Current	0mA	-	2mA	
Dimming Output Range	10%I _o set	-	I _o set	50%I _o max ≤ I _o set ≤ 100%I _o max
	5%I _o max	-	I _o set	5%I _o max ≤ I _o set < 50%I _o max

Safety & EMC Compliance

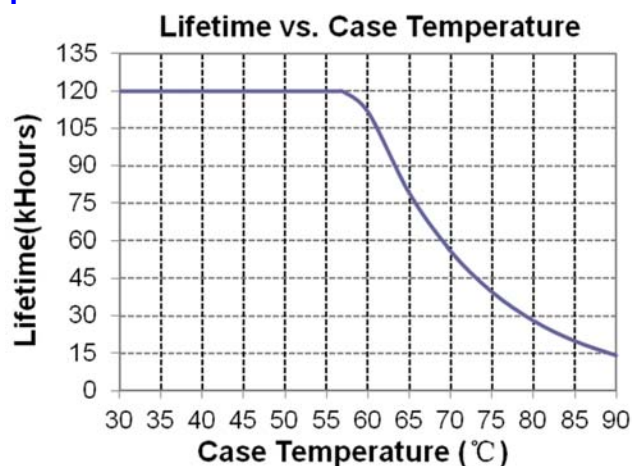
Safety Category	Standard
ENEC & TUV & CE ⁽¹⁾	EN 61347-1, EN 61347-2-13
CB	IEC 61347-1, IEC 61347-2-13
KS	KS C 7655
EMI Standards	Notes
EN 55015 ⁽²⁾	Conducted emission Test & Radiated emission Test
EN 61000-3-2	Harmonic current emissions
EN 61000-3-3	Voltage Fluctuations & Flicker
EMS Standards	Notes
EN 61000-4-2	Electrostatic Discharge(ESD): 8kV air discharge, 4kV contact discharge
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS
EN 61000-4-4	Electrical Fast Transient/Burst-EFT
EN 61000-4-5	Surge Immunity Test: AC Power Line: Differential Mode 4 kV, Common Mode 6 kV
EN 61000-4-6	Conducted Radio Frequency Disturbances test-CS

Safety & EMC Compliance (Continued)

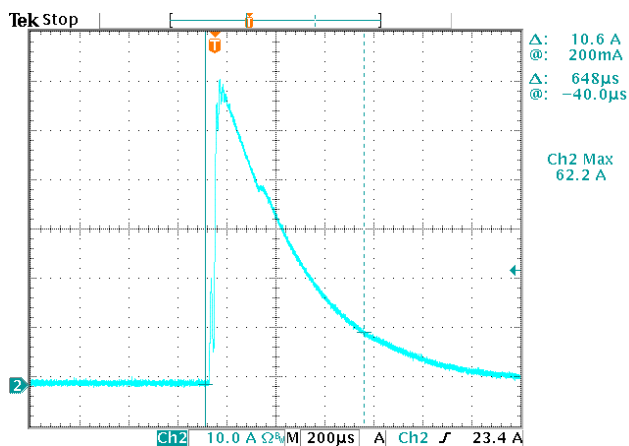
EMS Standards	Notes
EN 61000-4-8	Power Frequency Magnetic Field Test
EN 61000-4-11	Voltage Dips
EN 61547	Electromagnetic Immunity Requirements Applies To Lighting Equipment
DALI Standards	Notes
DALI	IEC62386-101,102 & part of 207 ⁽³⁾

- Note:** (1) For compliance with EU Directive 2009/125/EC (ecodesign requirements for energy-related products) the Dim-to-Off function shall not be used or alternatively be interrupted through use of a relay or similar device to prevent excessive standby power consumption (as illustrated in Implementation 2).
 (2) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.
 (3) Optional Commands Implemented: 242 (query short circuit), 243 (query open circuit)

Lifetime vs. Case Temperature



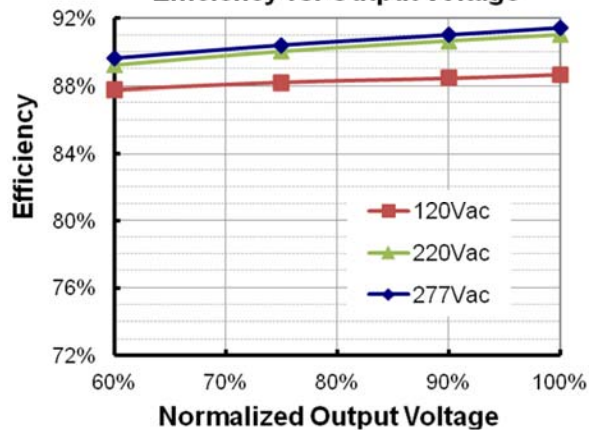
Inrush Current Waveform



Efficiency vs. Load

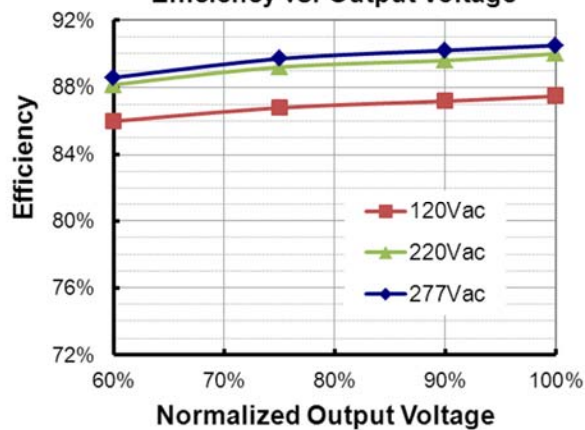
EUD-096S090BV (Io=450mA)

Efficiency vs. Output Voltage



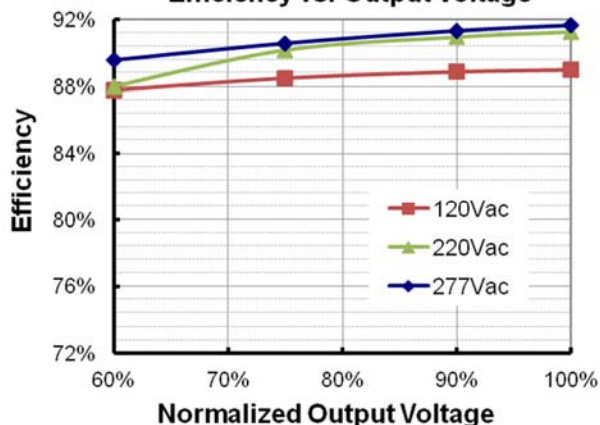
EUD-096S090BV (Io=900mA)

Efficiency vs. Output Voltage



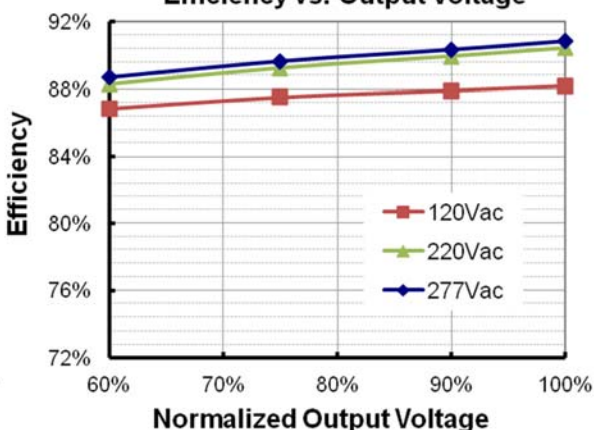
EUD-096S180BV (Io=900mA)

Efficiency vs. Output Voltage



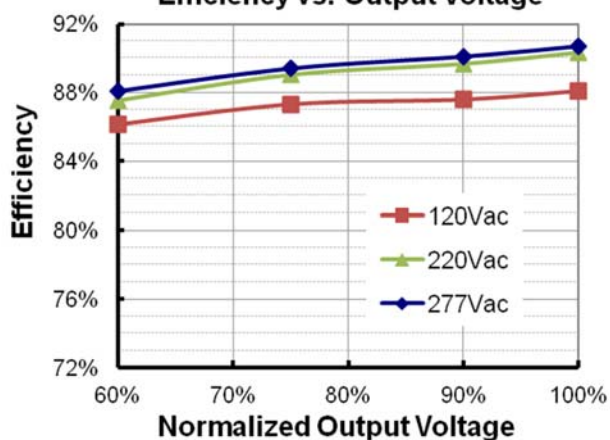
EUD-096S180BV (Io=1800mA)

Efficiency vs. Output Voltage



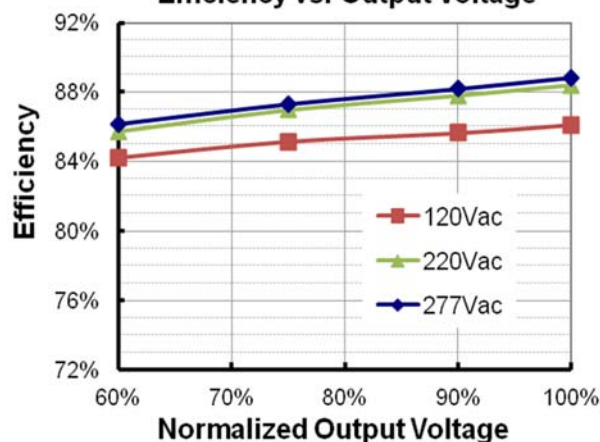
EUD-096S360BV (Io=1800mA)

Efficiency vs. Output Voltage

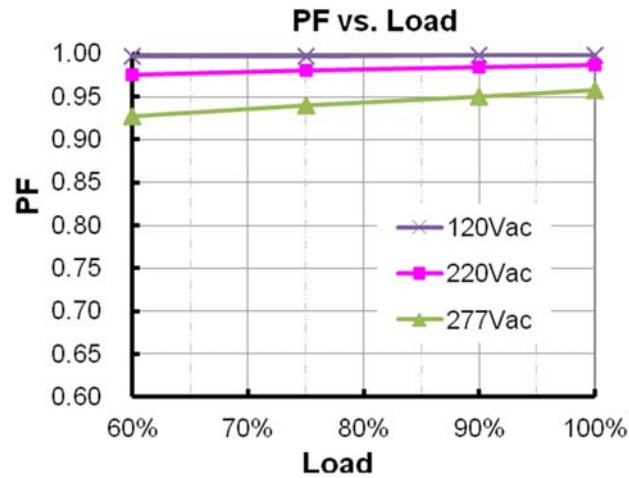


EUD-096S360BV (Io=3600mA)

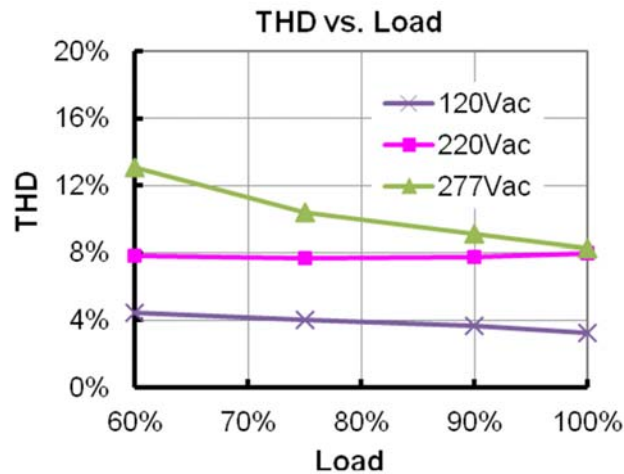
Efficiency vs. Output Voltage



Power Factor



Total Harmonic Distortion



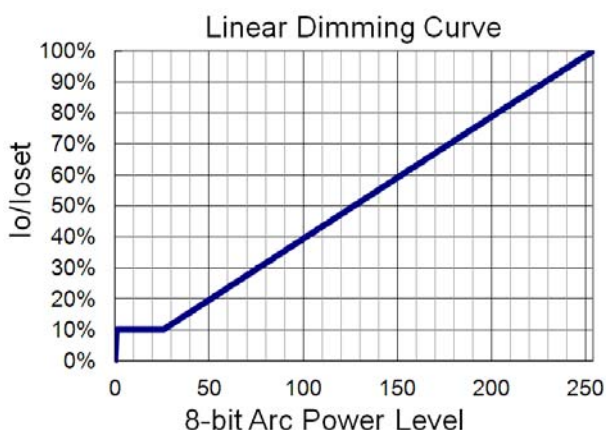
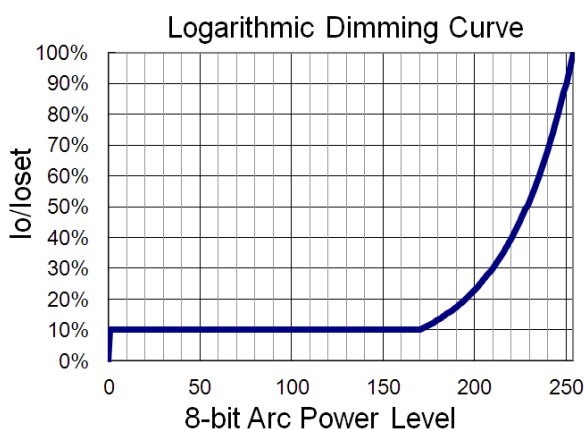
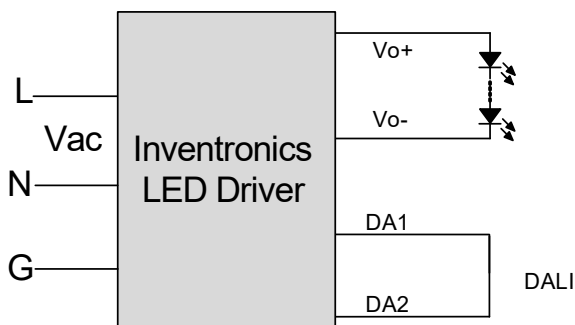
Protection Functions

Parameter	Notes
Over Temperature Protection	Decreases output current, returning to normal after over temperature is removed.
Short Circuit Protection	Auto Recovery. No damage will occur when any output is short circuited. The output shall return to normal when the fault condition is removed.
Over Voltage Protection	Limits output voltage at no load and in case the normal voltage limit fails.

Dimming

● DALI Dimming

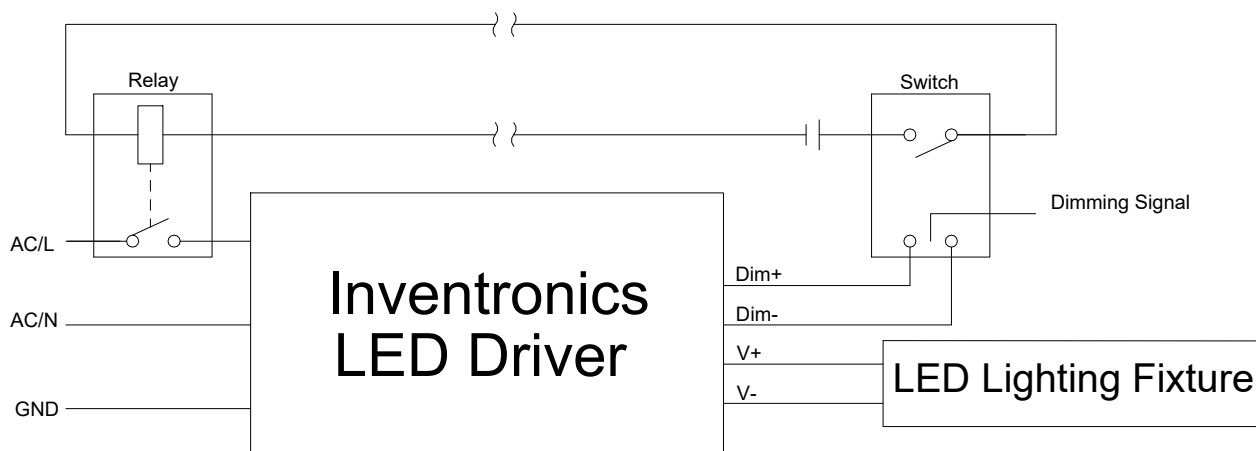
The recommended implementation of the dimming control is provided below.



Implementation 1: DALI Dimming

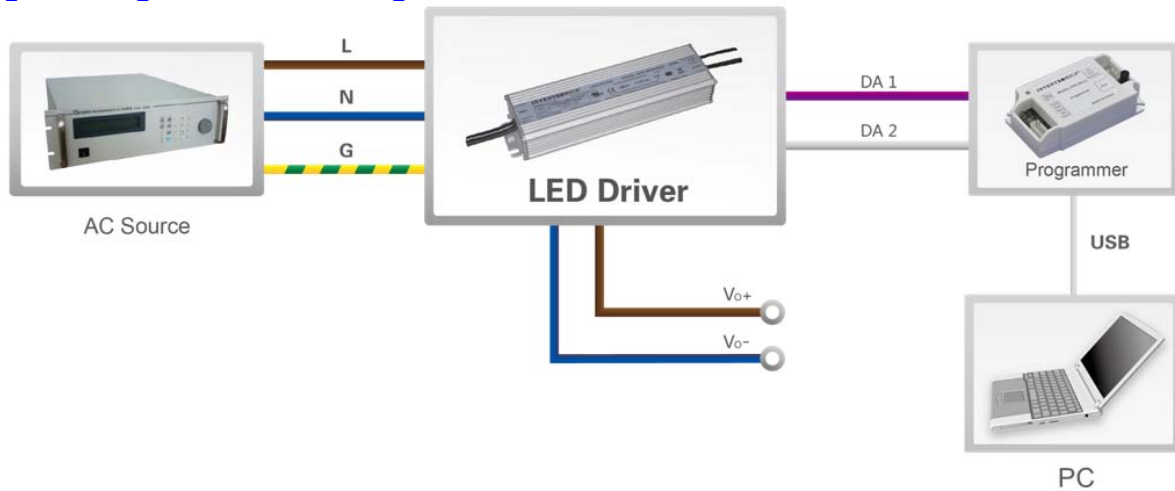
● 0% Light Brightness

If the brightness of the LED lighting fixture down to 0%, please refer to the following wiring method. The lamp can be turned on/off using a switch and relay.



Implementation 2: 0% Light Brightness Wiring Method

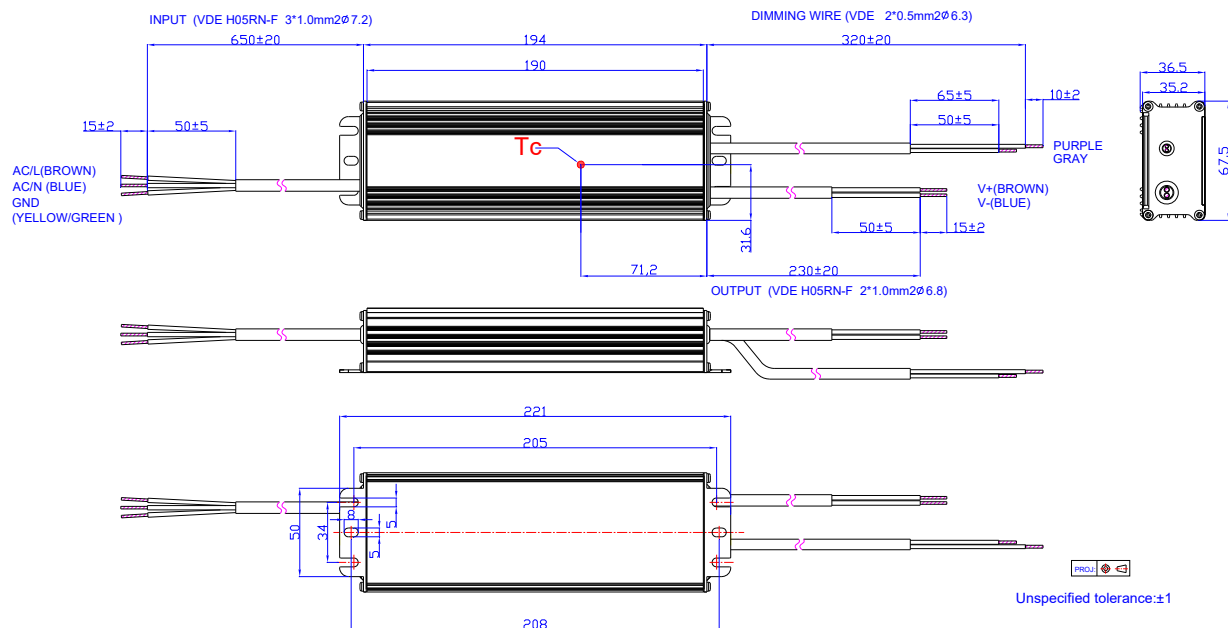
Programming Connection Diagram



Note: The driver needs to be powered on during the programming process.

- Please refer to [PRG-MUL2](#) Multi-Programmer datasheet for details.

Mechanical Outline



RoHS Compliance

Our products comply with reference to RoHS Directive (EU) 2015/863 amending 2011/65/EU, calling for the elimination of lead and other hazardous substances from electronic products.

Revision History

Change Date	Rev.	Description of Change		
		Item	From	To
2014-08-30	A	Datasheets Release	/	/
2015-03-30	B	CCC	/	Added
		Features	/	Input Surge Protection: 4kV line-line, 6kV line-earth
		Input Specifications	Leakage Current	Updated
		Output Specifications	Output Current Ripple(pk-pk)	Total Output Current Ripple (pk-pk)
		Output Current Ripple at < 200 Hz (pk-pk)	/	Added
		General Specifications	Case Temperature	Operating Case Temperature for Safety Tc_s
		General Specifications	/	Operating Case Temperature for Warranty Tc_w
		General Specifications	/	Storage Temperature
		Environmental Specifications	/	Delete
		Derating	/	Delete
		Mechanical Outline	/	Updated
2015-09-16	C	KS, DALI Logo	/	Added
		Features	/	Updated
		Safety & EMC Compliance	Safety & EMC Compliance	Standards Compliance
		Standards Compliance	DALI Standards	Added
2016-04-13	D	Input Specifications	Leakage Current	Updated
		General Specifications	With mounting ear	Added
		General Specifications	Net Weight	Update
		Standards Compliance	/	Updated
2019-08-23	E	TUV Logo	/	Updated
		ENEC Logo	/	Updated
		CCC Logo	/	Deleted
		Features	Input surge protection	Updated
		Features	Suitable for Independent Use	Independent Logo
		Description	/	Updated
		Input Specifications(PF/THD)	50-60Hz	Added
		Output Specifications (Turn-on Delay Time)	65%-100% Load	Added

Revision History (Continued)

Change Date	Rev.	Description of Change		
		Item	From	To
2019-08-23	E	Safety &EMC Compliance	ENEC	Added
		Safety &EMC Compliance	TUV	Added
		Safety &EMC Compliance	CB	Added
		Safety &EMC Compliance	KS	Updated
		Safety &EMC Compliance	EN 61000-4-5	Updated
		Mechanical Outline	/	Updated
		RoHS Compliance	/	Updated
2021-11-19	F	Features	/	Updated
		Safety &EMC Compliance	Note (1)	Added
		0% Light Brightness	/	Added