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 and UL Dry / Damp / Wet Location
- Class 2 & SELV Output
- TYPE HL, for use in a Class I, Division 2 hazardous (Classified) location

Description

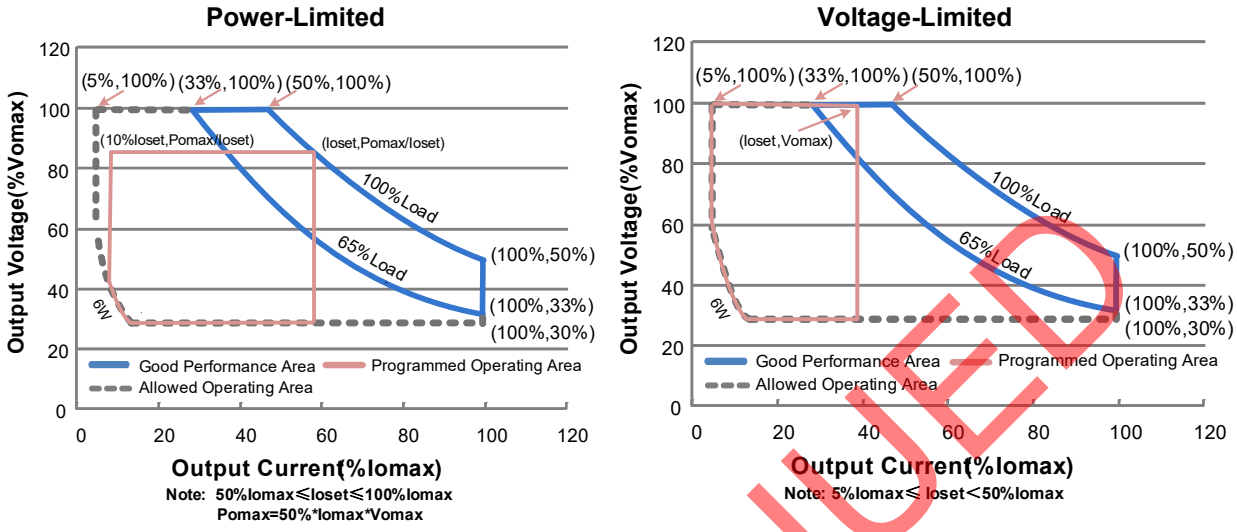
The *EUD-096SxxxBT* series is a 96W, constant-current, programmable LED driver that operates from 90-305 Vac input with excellent power factor. Created for many lighting applications including low bay, tunnel and street, etc. It provides a dim-to-off mode with low standby power. The high efficiency of 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/ 127~300 Vdc	64~214Vdc	96 W	91.0%	0.99	0.96	EUD-096S090BT
90-1800mA	900-1800mA	1050 mA	90~305 Vac/ 127~300 Vdc	32~107Vdc	96 W	90.5%	0.99	0.96	EUD-096S180BT(4)
180-3600mA	1800-3600mA	2100 mA	90~305 Vac/ 127~300 Vdc	16 ~ 53Vdc	96 W	90.0%	0.99	0.96	EUD-096S360BT(5)

Notes: (1) Output current range with constant power at 96W
(2) UL, FCC certified input voltage range: 100-277Vac or 127-300Vdc; otherwise: 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
(5) Class 2 & 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	-	300 Vdc	
Input Frequency	47 Hz	-	63 Hz	
Leakage Current	-	-	0.75 MIU	UL8750; 277Vac/ 60Hz
	-	-	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^2s	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%Ioset	-	5%Ioset	At 100% load condition
Output Current Setting(Ioset) Range	5%Iomax	-	100%Iomax	
Output Current Setting Range with Constant Power	50%Iomax	-	100%Iomax	
Total Output Current Ripple (pk-pk)	-	5%Iomax	10%Iomax	At 100% load condition, 20 MHz BW

Output Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Output Current Ripple at < 200 Hz (pk-pk)	-	1%Iomax	-	At 100% load condition. Only this component of ripple is associated with visible flicker.
Startup Overshoot Current	-	-	10%Iomax	At 100% load condition
No-load Output Voltage EUD-096S090BT EUD-096S180BT EUD-096S360BT	 - - -	 - - -	 240 V 119 V 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.
Temperature Coefficient of Ioset	-	0.03%/°C	-	Case temperature = 0°C ~Tc max

General Specifications

Parameter	Min.	Typ.	Max.	Notes
Efficiency at 120 Vac input: EUD-096S090BT Io=450 mA Io=900 mA EUD-096S180BT Io=900 mA Io=1800mA EUD-096S360BT Io=1800mA Io=3600mA	 85.5% 84.5% 85.0% 84.0% 84.5% 83.0%	 88.5% 87.5% 88.0% 87.0% 87.5% 86.0%	 - - - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
Efficiency at 220 Vac input: EUD-096S090BT Io=450 mA Io=900 mA EUD-096S180BT Io=900 mA Io=1800mA EUD-096S360BT Io=1800mA Io=3600mA	 89.0% 88.0% 88.5% 87.5% 88.0% 86.5%	 91.0% 90.0% 90.5% 89.5% 90.0% 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.)
Efficiency at 277 Vac input: EUD-096S090BT Io=450 mA Io=900 mA EUD-096S180BT Io=900 mA Io=1800mA EUD-096S360BT Io=1800mA Io=3600mA	 89.5% 88.5% 89.0% 88.0% 88.5% 87.0%	 91.5% 90.5% 91.0% 90.0% 90.5% 89.0%	 - - - - - -	Measured at 100% load and steady-state temperature in 25°C ambient; (Efficiency will be about 2.0% lower if measured immediately after startup.)
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)

General Specifications (Continued)

Parameter	Min.	Typ.	Max.	Notes
Lifetime	-	111,000 Hours	-	Measured at 220Vac input, 80%Load and 60°C case temperature; See lifetime vs. Tc curve for the details
Operating Case Temperature for Safety Tc_s	-40°C	-	+86.6°C	
Operating Case Temperature for Warranty Tc_w	-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%Ioset	-	Ioset	50%Iomax ⩽ Ioset ⩽ 100%Iomax
	5%Iomax	-	Ioset	5%Iomax ⩽ Ioset ＜ 50%Iomax

Safety &EMC Compliance

Safety Category	Standard
UL/CUL	UL 8750,UL1310,CAN/CSA-C22.2 No. 250.13,CAN/CSA-C22.2 No. 223-M91
CE(1)	EN 61347-1, EN 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
FCC Part 15(2)	ANSI C63.4 Class B
	This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: [1] this device may not cause harmful interference, and [2] this device must accept any interference received, including interference that may cause undesired Operation.

Standards Compliance (Continued)

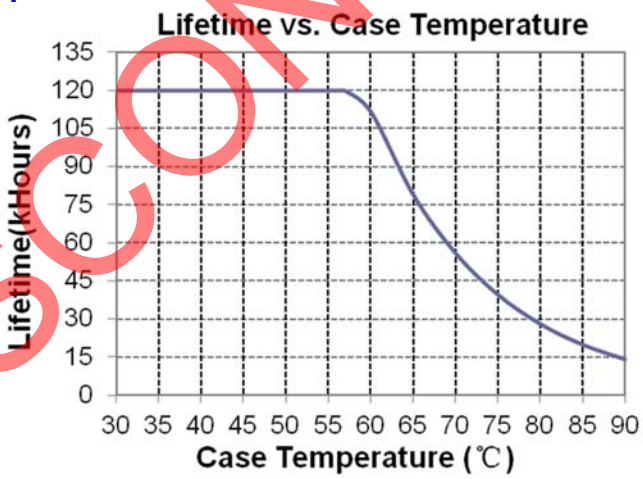
EMS Standards	Notes
EN 61000-4-2	Electrostatic Discharge(ESD): 8kV air discharge, 4kV contact discharge
EN 61000-4-3	Radio-Frequency Electromagnetic Field Susceptibility Test-RS
EN 61000-4-4	Electrical Fast Transient/Burst-EFT
EN 61000-4-5	Surge Immunity Test: AC Power Line: Differential Mode 4 kV, Common Mode 6 kV
EN 61000-4-6	Conducted Radio Frequency Disturbances test-CS
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).

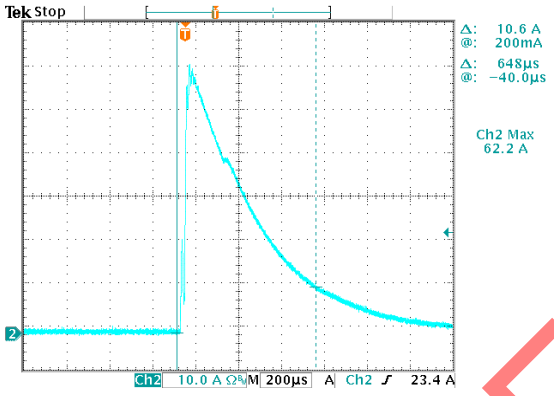
(2) This LED driver meets the EMI specifications above, but EMI performance of a luminaire that contains it depends also on the other devices connected to the driver and on the fixture itself.

(3) Optional Commands Implemented: 242 (query short circuit), 243 (query open circuit)

Lifetime vs. Case Temperature

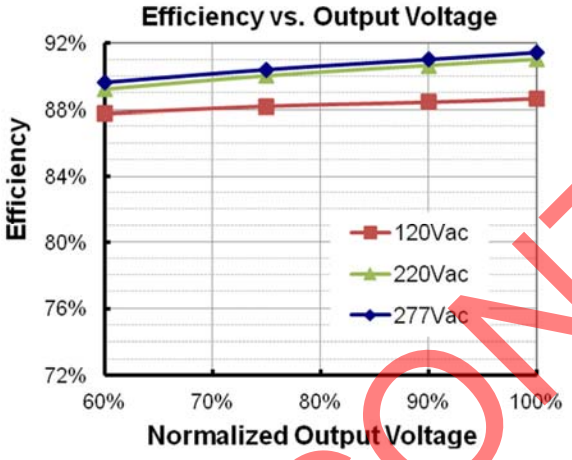


Inrush Current Waveform

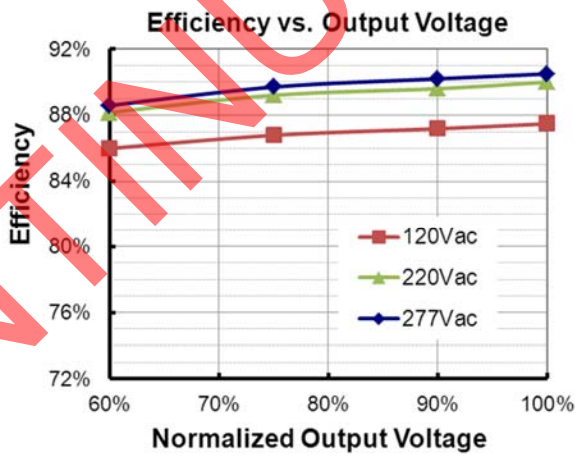


Efficiency vs. Load

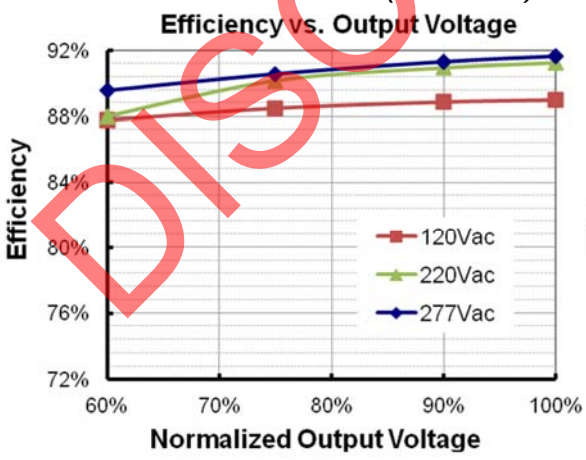
EUD-096S090BT(Io=450mA)



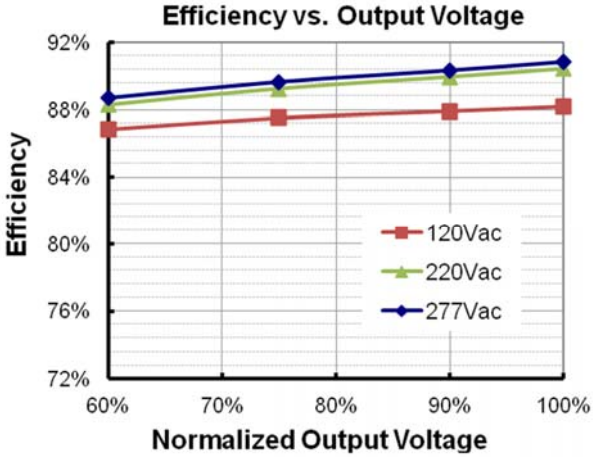
EUD-096S090BT(Io=900mA)



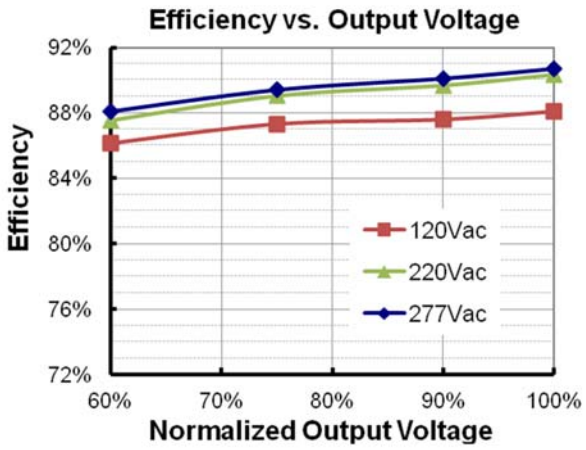
EUD-096S180BT(Io=900mA)



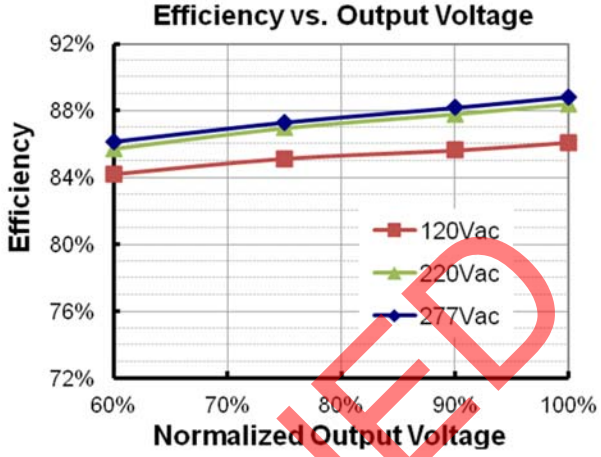
EUD-096S180BT(Io=1800mA)



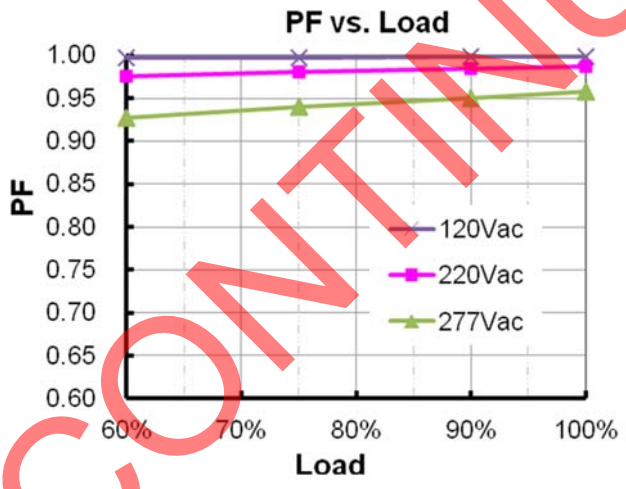
EUD-096S360BT(Io=1800mA)



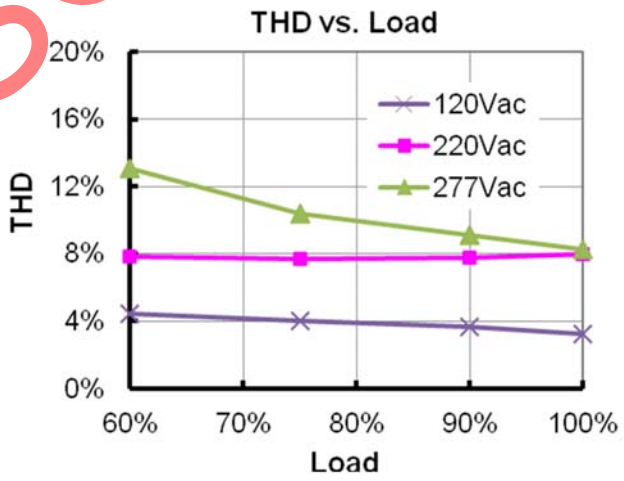
EUD-096S360BT(Io=3600mA)



Power Factor



Total Harmonic Distortion



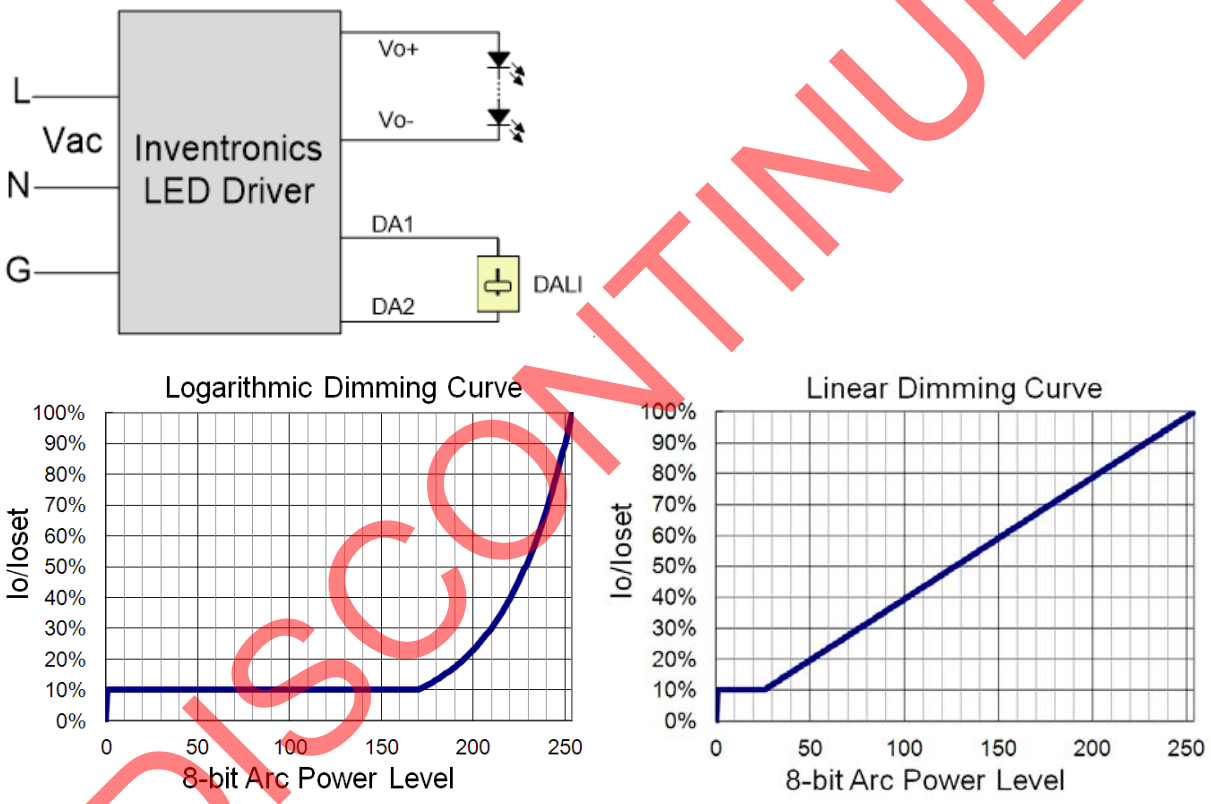
Protection Functions

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**

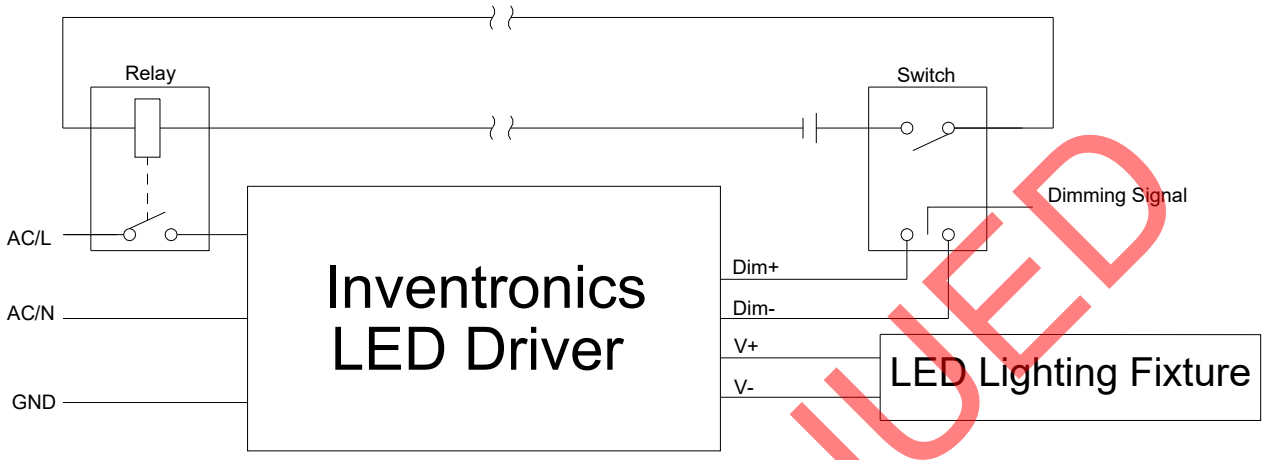
The recommended implementation of the dimming control is provided below.



Implementation 1: DALI Dimming

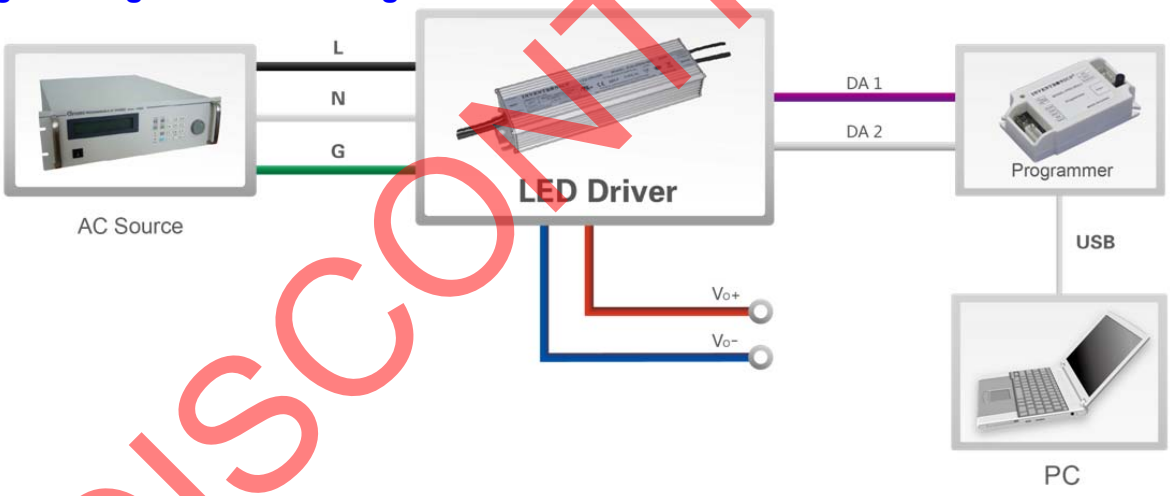
- **0% Light Brightness**

  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

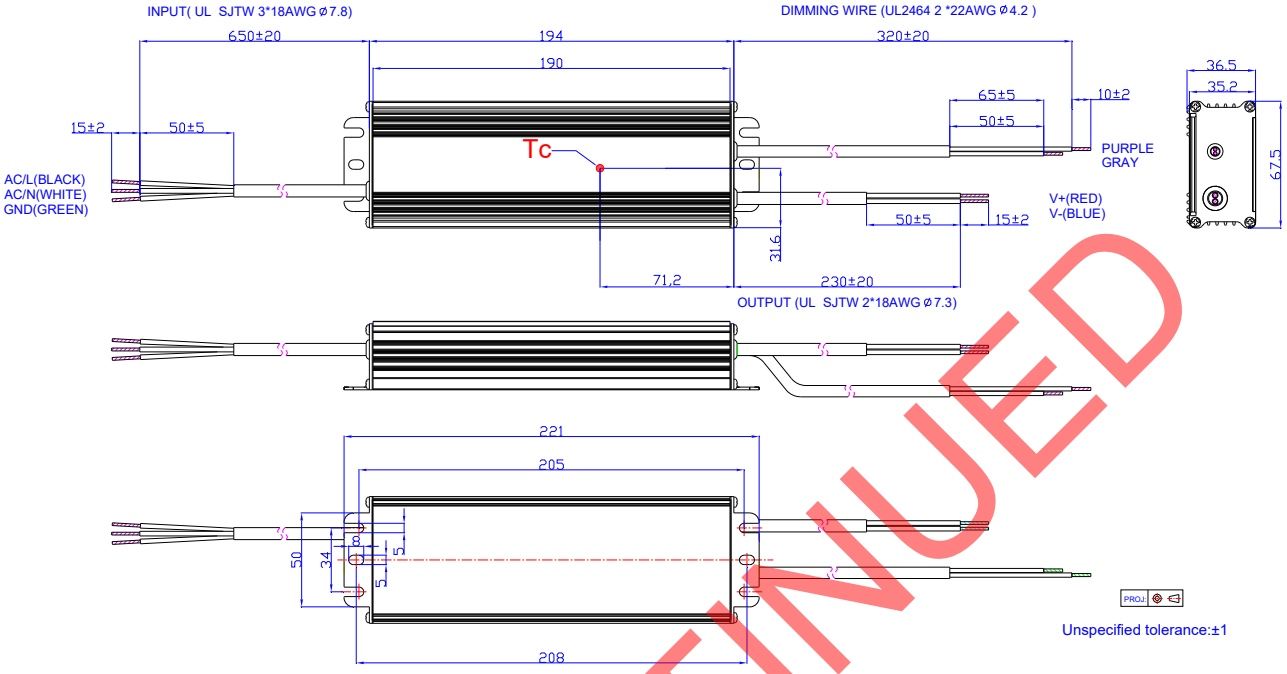
Programming Connection Diagram



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	/	/
2015-3-30	B	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
		Case Temperature	86°C	86.6°C
		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	/	Update
		Safety & EMC Compliance	Safety & EMC Compliance	Standards Compliance
		Standards Compliance	DALI Standards	Added
2016-04-13	D	General Specifications	With mounting ear	Added
		General Specifications	Net Weight	Update
		Standards Compliance	/	Update
2019-08-23	E	Features	Input surge protection	Updated
		Description	/	Updated
		Input Specifications(PF/THD)	50-60Hz	Added
		Safety &EMC Compliance	UL/CUL	Updated
		Safety &EMC Compliance	KS	Updated
		Safety &EMC Compliance	FCC	Updated
		Safety &EMC Compliance	EN 61000-4-5	Updated
		Mechanical Outline	/	Updated
		RoHS Compliance	/	Updated

Revision History (Continued)

Change Date	Rev.	Description of Change		
		Item	From	To
2021-11-19	F	Features	/	Updated
		Safety &EMC Compliance	Note (1)	Added
		0% Light Brightness	/	Added