

Features

- DALI DT6/PUSH/0-10V/PWM/Rx dimmable
- Built-in active PFC function
- Standby power consumption <0.5W
- Flicker free
- All-round protections: over current protection and short circuit protection
- IP20
- Suitable for Class I light fixtures
- 5-year warranty (please refer to the warranty condition)



Applications

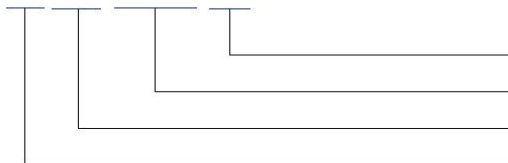
· Indoor office lighting · decorative lighting · commercial lighting · residential lighting

Descriptions

LF-GAD040-1650-24 is a 40W DALI DT6/PUSH/0-10V/PWM/Rx dimmable constant voltage LED driver featuring constant voltage output 24Vdc and maximum load current 1.65A. Its input voltage ranges from 220 to 240Vac and it has all-round protections: over current protection and short circuit protection.

Product Model

LF - GAD 040 - 1650 - 24



- 24: output voltage: 24V
- 1650: max. output current: 1650mA
- 040: output power: 40W
- GAD: 5-in-1 dimming LED driver

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■ Electrical Characteristics

Model		LF-GAD040-1650-24				
Output	Output Voltage	24V				
	Output Current	1.65A max.				
	Flicker Index (Modulation Depth)	IEC-Pst ≤ 1 , CIE SVM ≤ 0.9 , modulation depth $\leq 1\%$ Complies with flicker-free standard (IEEE Std 1789-2015)				
	Ripple Voltage	$< 10\%$				
	Voltage Tolerance	$\pm 3\%$				
	Temperature Drift	$\pm 10\%$				
	Start-up Time	$< 1.5\text{S}$				
Input	Input Voltage	220-240Vac (voltage limit: 198-264Vac)				
	DC Input Voltage	180-264Vdc				
	Input Frequency	47-63Hz				
	Input Current	0.3A max.				
	PF	≥ 0.9				
	THD	$\leq 10\%$				
	Efficiency	$\geq 85\%$				
	Inrush Current	$\leq 40\text{A} \& 250\mu\text{S} @ 230\text{Vac}$				
	Load Quantities of Circuit Breaker	Model	B10	C10	B16	C16
		Quantity (pcs)	13	22	21	35
	Leakage Current	$\leq 0.7\text{mA}$				
	Standby Power Consumption	$\leq 0.5\text{W}$ (light off)				
Protection Characteristics	Over Voltage	$< 33\text{V}$				
	Short Circuit	Hiccup mode (auto-recovery)				
Environment Descriptions	Operating Temperature	$-20^{\circ}\text{C} - +50^{\circ}\text{C}$				
	Operating Humidity	20-90%RH (no condensation)				
	Storage Temperature/ Humidity	$-30^{\circ}\text{C} - 80^{\circ}\text{C}$ (6 months in Class I environment); 20-95%RH (no condensation)				
	Atmospheric Pressure	86-106kPa				

■ Electrical Characteristics

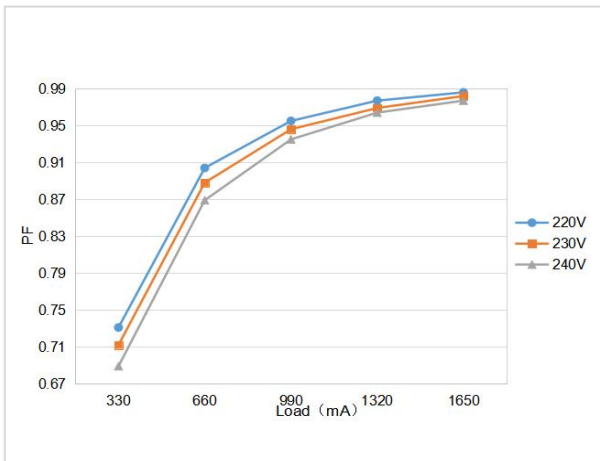
Safety & EMC	Certifications	TUV-ENEC, CE, CB, RCM, CCC
	Withstanding Voltage	I/P-O/P: 3.75kV 5mA 60S; I/P-PE: 1.5kVac, <5mA 60S; O/P-PE: 0.5kVac, <5mA 60S
	Insulation Resistance	I/P-O/P: >100MΩ@500Vdc; I/P-PE: 500Vdc, >100MΩ; O/P-PE: 500Vdc, >100MΩ
	Safety Standards	ENEC: EN61347-1: 2015, EN61347-2-13: 2014/A1: 2017, EN62384 2016/A1: 2009 CCC: GB19510.1-2009, GB19510.14-2009 RCM: AS61347.2-13: 2018 SAA: AS61347.2-13: 2018 CE-LVD: EN61347-2-13: 2014/A1: 2017, EN61347-1: 2015, EN62493: 2015 CB: IEC61347-1: 2015, IEC61347-2-3: 2014, IEC 61347-2-13: 2014/AMD1: 2016 ErP: EU 2019/2020@2019.12.05
	EMI	CE-EMC: EN55015, EN61000-3-2, EN61000-3-3 CCC: GB/T17743, GB17625.1, GB17625.2
	EMS	CE-EMC/RCM: EN61000-4-2, 3, 4, 5 (L-N: 1kV, L/N-PG: 2kV), 6, 11 CCC: GB/T17626.2, 3, 4, 5, 6, 1
Other Parameters	IP Rating	IP20
	RoHS	RoHS 2.0 (EU) 2015/863
	Warranty	5 years (Tc≤90℃)
	Compatibility of DALI Dimming	Yuanhao Master, Philips Master DDBC120-DALI, OSRAM Master, Helvar Master 905 Router, Tridonic Master-24138923, HDL MC64-DALI431 Master
	DALI Standard	IEC 62386-101 102 207: DALI 2.0
	Noise Level	≤29dBA (this data is measured in a soundproof room and the noise collector should be 10CM away from LED driver)

■ **Electrical Characteristics**

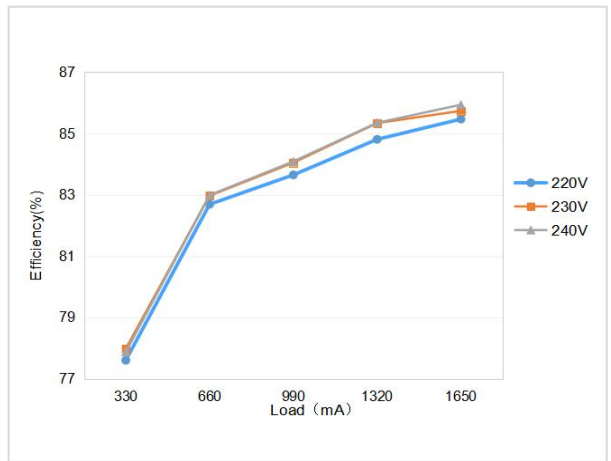
<p>Test Equipment</p>	<p>AC power source: CHROMA6530, digital power meter: CHROMA66202, oscilloscope: Tektronix DPO3014, DC electronic load: M9712B, LED board, constant temperature and humidity chamber, lightning surge generator: Everfine EMS61000-5B, rapid group pulse generator: Everfine EMS61000-4A, spectroanalyzer: KH3935, hi-pot tester: EEC SE7440, flicker tester (flicker-free coefficient test): Everfine LFA-3000, etc.</p>
<p>Test Remark</p>	<p>If there are no special remarks, the above parameters are tested at the ambient temperature of 25°C, humidity of 50%, full load and input voltage of 230Vac/50Hz.</p>
<p>Additional Remarks</p>	<ol style="list-style-type: none"> 1. It is recommended that user install the over voltage protection, under voltage protection and surge protection devices in the power supply circuits of light fixtures to ensure electricity safety. 2. The PC cover, casing and end cap for assembling the LED driver in the light fixture must meet the fire rating of UL94-V0 or above. 3. The LED driver used in combination with the end device is one of the accessories of the whole light fixture, and the EMC of the whole light fixture is not only susceptible to the driver itself, but to the LED light fixture and the whole light fixture's wiring. Thus, the manufacturer of LED light fixture should re-confirm the EMC of the whole light fixture before the whole light fixture is finished. 4. When using the LED driver, please pay attention that the total output power not exceed the maximum rated output power, otherwise the warranty service of LED driver would be failed.

■ **Product Characteristic Curves**

PF Curve

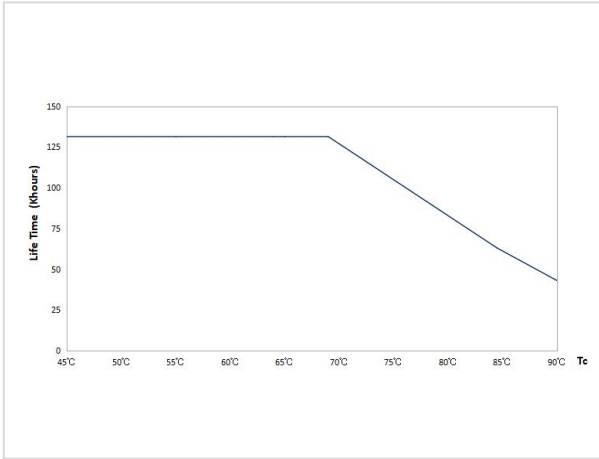


Efficiency Curve

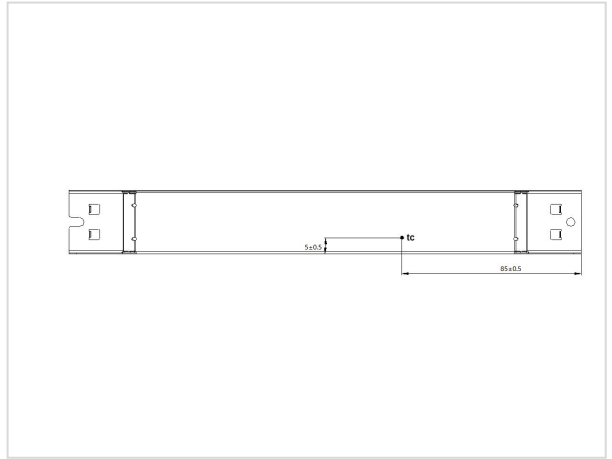


■ **Product Characteristic Curves**

Lifetime Curve



Tc Point Testing Diagram



■ **Product Definitions**

Product Terminals

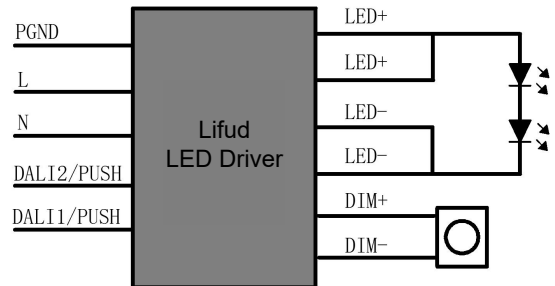
INPUT		OUTPUT	
AC-L	Input terminal of AC live wire	LED+	Positive electrode output of LED driver
AC-N	Input terminal of AC neutral wire	LED-	Negative electrode output of LED driver
PGND	Earth wire		
DALI2/PUSH	DALI2/PUSH dimming input	DIM+	Positive electrode of dimming
DALI1/PUSH	DALI1/PUSH dimming input	DIM-	Negative electrode of dimming

■ **Dimming Operation Instructions**

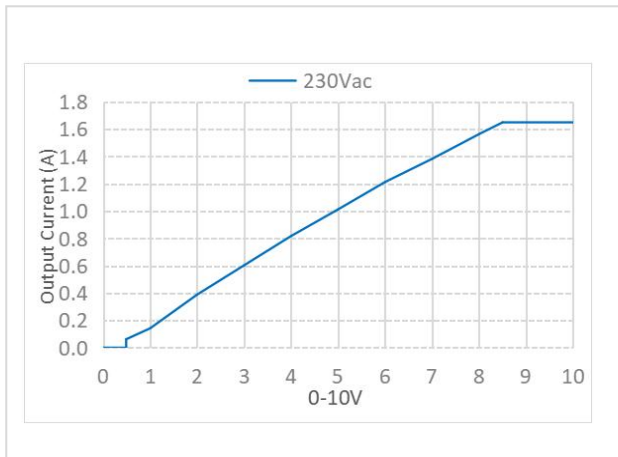
0-10V Dimming Operations

- Connect 0-10V signal to DIM terminal.
- In 0-10V dimming mode, when the input voltage is $0.3V \pm 0.1$, the light turns off; when it's $0.5V \pm 0.1$, the light turns on.
- Dimming depth: 0.3% (typical value) (max. output current)
- DIM+/DIM- (without signal connected): 100% rated current output

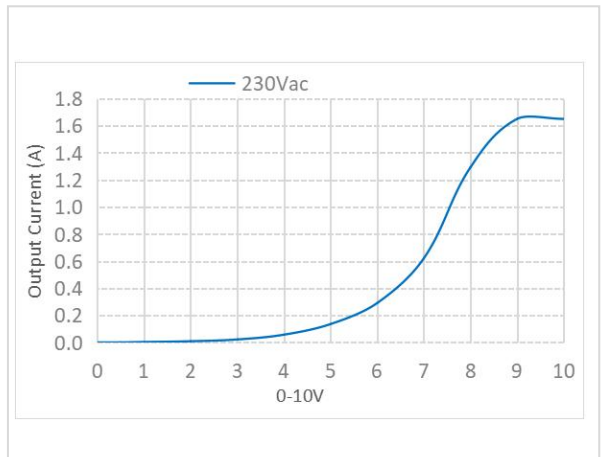
Wiring Diagram of 0-10V Dimming



0-10V Dimming Curve of Dim-to-off Version (linear)



0-10V Dimming Curve of Dim-to-off Version (logarithmic)



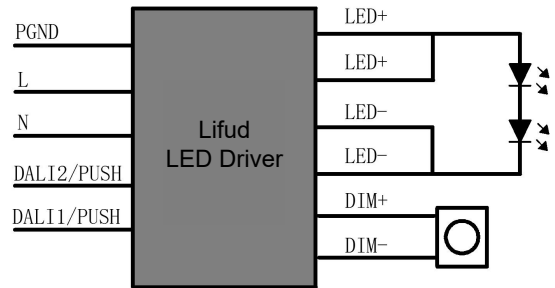
Input: 230Vac; output: 24Vdc/1650mA
 (this data is measured by Lifud 0-10V dimmer and the chart is for reference only)

■ **Dimming Operation Instructions**

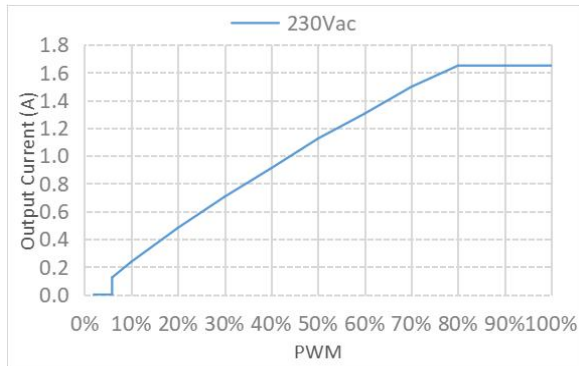
PWM Dimming Operations

- Connect PWM signal to DIM terminal.
- Compatible signal frequency: 0.4-3kHz; amplitude: 9-10(V); when it's 3.0%-5.2%, the light turns off; when it's 4.8%-7.0%, the light turns on.
- Dimming depth: 0.3% (max. output current)
- DIM+/DIM- (without signal connected): 100% rated current output

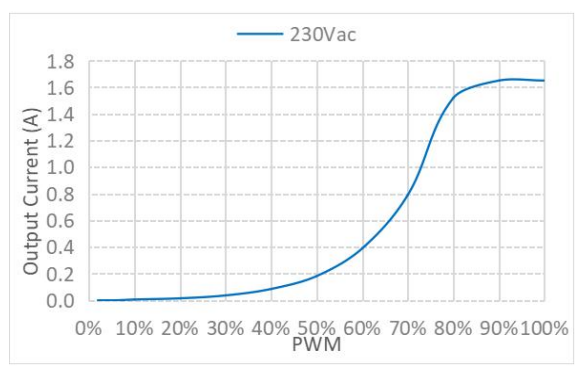
Wiring Diagram of PWM Dimming



PWM Dimming Curve of Dim-to-off Version (linear)



PWM Dimming Curve of Dim-to-off Version (logarithmic)



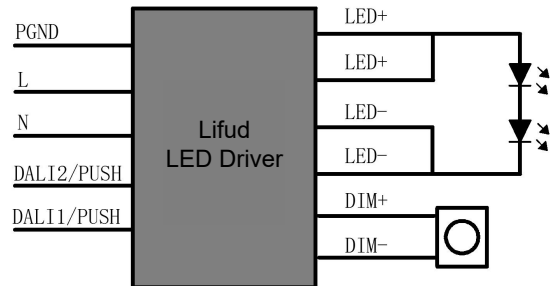
Input: 230Vac; output: 24Vdc/1650mA
 (this data is measured by PWM signal generator RIGOL and the chart is for reference only)

■ Dimming Operation Instructions

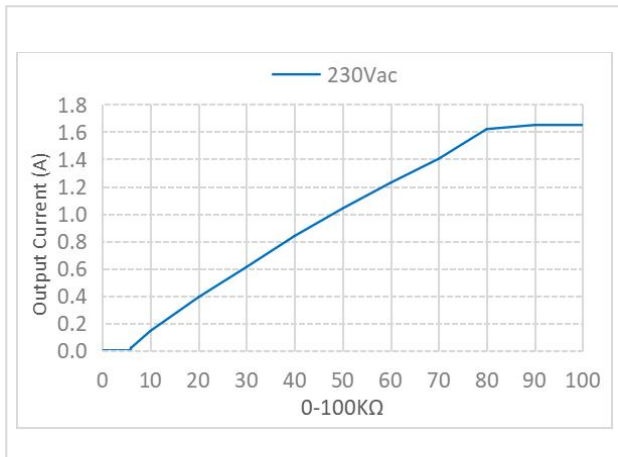
Rx Dimming Operations

- Connect Rx signal to DIM terminal.
When the resistance is $4 \pm 1K\Omega$, the light turns on; when it's $3 \pm 1K\Omega$, the light turns off.
- Range: 0-100K Ω
- Dimming depth: 0.3% (max. output current)
- DIM+/DIM- (without signal connected): 100% rated current output

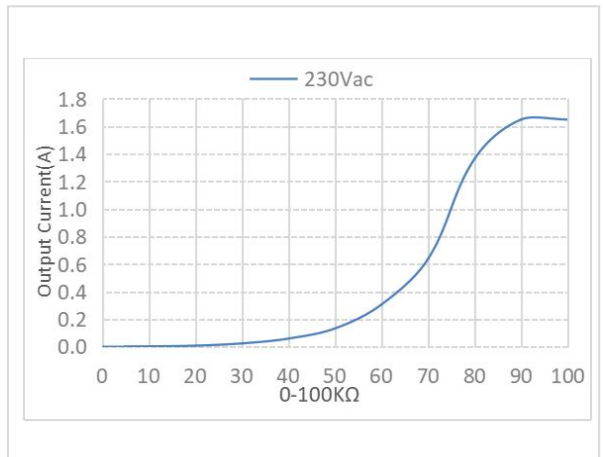
Wiring Diagram of Rx Dimming



Rx Dimming Curve of Dim-to-off Version (linear)



Rx Dimming Curve of Dim-to-off Version (logarithmic)



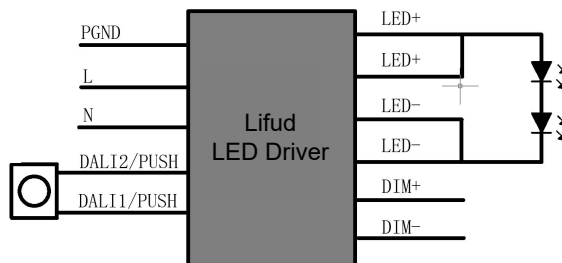
Input: 230Vac; output: 24Vdc/1650mA
(this data is measured by LEVITON dimmer and the chart is for reference only)

■ **Dimming Operation Instructions**

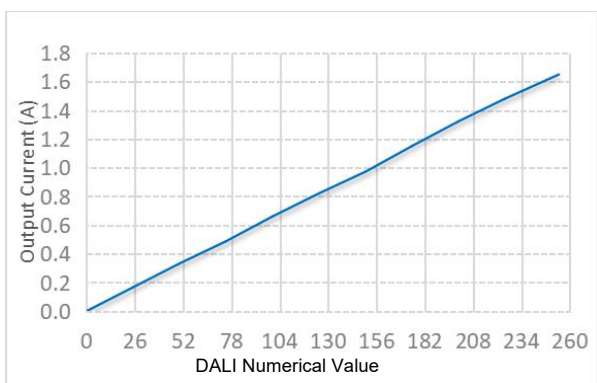
DALI Dimming Operations

- Default setting: 100% brightness
- Connect DALI signal to DA1/PUSH & DA2/PUSH terminals.
- DALI protocol includes 16 groups
- Max. quantity of drivers connected in parallel in DALI dimming mode: 64 pcs.
- Min. dimming depth of DALI dimming: 0.3% (max. output current)

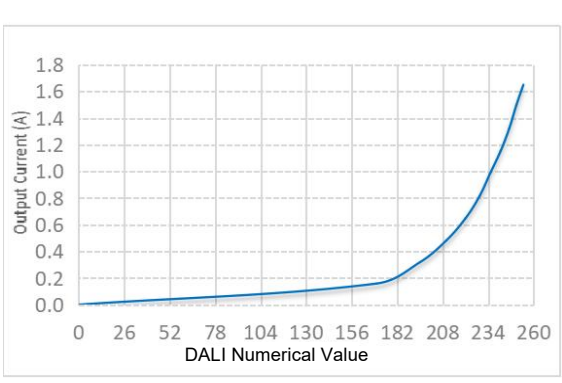
Wiring Diagram of DALI Dimming



DALI Dimming Curve (linear)

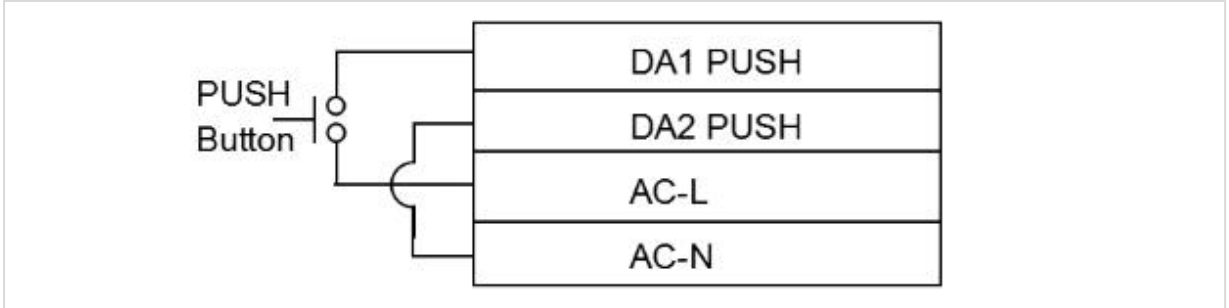


DALI Dimming Curve (logarithmic)



■ **Dimming Operation Instructions**

Wiring Diagram of PUSH Dimming



PUSH Dimming Operations

Operation	Duration	Function
Instant Push	0.1-0.5 sec	LED light on/off
Long Push	0.6-9 sec	Dim up/down the light
Reset Push	>9 sec	Reset to 50% brightness

- The PUSH operation won't cause any variations on LED driver if it's less than 0.1S.
- Connect the PUSH switch in series between AC-L and DA1/PUSH terminals; short circuit AC-N and DA2/PUSH terminals.
- Min. dimming depth of PUSH dimming: 1% (max. output current)
- The PUSH dimming mode has the memory function in case of any power failure. When the LED driver is powered on again, the light will return to the previous state before power failure.

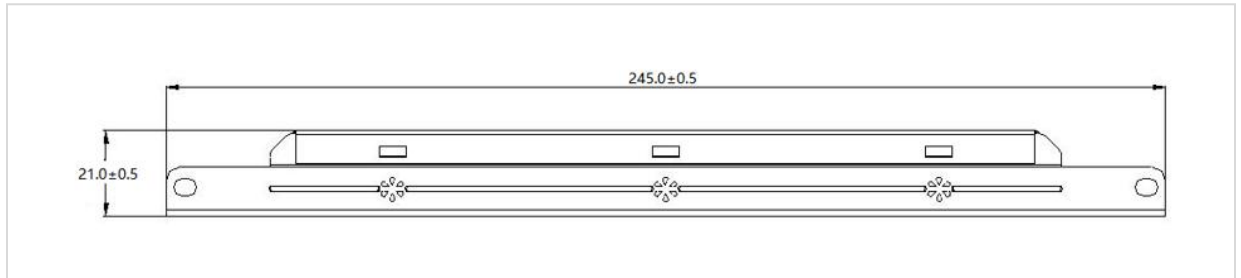
Switching of Dimming Mode

- Default setting: DALI logarithmic dimming mode; use DALI programming software to switch to linear dimming mode
- **Switch to PUSH dimming mode**
After powering the driver on by AC for 2 secs, long press the PUSH button and keep it for more than 3 secs.
- **Switch to 0-10V/PWM/Rx dimming mode**
After powering the driver on by AC for 2 secs, adjust the 0-10V/PWM/Rx dimmer (from max. to min. or min. to max.) and wait for 1 sec
- **Switch to DALI dimming mode**
After powering the driver on by AC for 2 secs, press the DALI dimmer for ON/OFF operation.
(When switching from DALI dimming mode to others, the DALI light must be on; if the DALI light is off, the dimming mode cannot be switched by default.)

■ **Structure & Dimensions (unit: mm)**

Overall Appearance

Model	Overall Appearance (L*W*H)	Distance Between 2 Positioning Holes	Diameter of Positioning Hole
LF-GAD040-1650-24	245*30*21 mm	235 mm	4.2 mm



■ **Packaging Specifications**

Model	LF-GAD040-1650-24
Carton Size	385*285*210 mm (L*W*H)
Quantity	8 pcs/layer; 7 layers/ctn; 56 pcs/ctn
Weight	0.2±0.1% kg/pc; 12±0.2 kg/ctn

■ Transportation and Storage

1. Transportation

- Suitable transportation means: vehicles, boats and aeroplanes.
- In transit, it is necessary to prepare awnings for rain or sun protection. Moreover, please keep civilized loading and unloading to prevent the vibration or impact of LED driver as much as possible.

2. Storage

- The storage of LED driver shall conform to the standard of Class I environment. When using LED drivers which have been stored for more than 6 months, please re-test them firstly. Do not use them unless they are tested to be qualified.

Cautions

- Please use Lifud LED driver according to its parameters in the specification, otherwise the LED driver may malfunction.
- Using any incompatible light fixtures or those that have not been certified may cause fire, explosion or other risks.
- Man-made damage is beyond the scope of Lifud warranty service.

Remark: Lifud Technology Co., Ltd. reserves the right to interpret any contents of this specification.