LEDGEAR® Specification

GENERAL GUIDELINES

Kinglumi has expanded its range of LEDGEAR DALI drivers with NFC programmability via the LEDGEAR software. This software simplifies parameter settings and extends functions like constant light output (CLO) and the DALI data. Equipped with NFC technology, the LEDGEAR software allows for wireless setting and transfer LED driver parameters saving time and costs in production. It also makes installation and maintenance conveniently for electricians.

The drivers have NFC programmability, precise output current increments, flicker-free dimming, extra wide operating range, extra deep dimming capabilities, with 50% PCR material housing, compliance with ErP2024 standards, and compatibility with DALI 2 and Push-DIM dimming modes. They are DALI-2 certified, and DALI configurations such as addressing, grouping, scene setting, power on level, and fade time can be easily adjusted through NFC.

Product description

- Easy Commission and maintenance thanks to the NFC read & write setting
- Design DALI-2, Push-DIM, output 2in1 dimming
- DALI member, compatible with universal DALI application controllers(also called masters, DALI USB)
- Energy data and diagnostics data enabled according to DALI part 251, 252, 253, constant light output(CLO)
- Reliable, Class II, SELV according EN 61347
- ENEC, CE, CB approved by TUV SUD, SAA, C-tick qualified
- ±3% output current accuracy(under maximum load)
- Permissible AC cable 0.75-2.5mm² wire gauge, 8~10mm PVC jacket diameter
- ErP2024 Compliant: Pst<1.0, SVM<0.4, standby<0.35W, flicker<3%
- Output Current Increments: 1.5mA
- Protection for output open load, short circuits, over voltage and over temperature
- Built--in with permanent memory for DALI and Push-DIM, 100,000 times memory
- Grow wire tested 650° for 30S and 850° for 5S
- 90°C Maximum case operation temperature(tc-point [1])
- Housing: incorporating 50% PCR material
- Operating temperature [1]: -25°C ~ +50°C, the humidity: 20% ~ 85%
- Over 50,000 hrs nominal lifespan [1]
- Five-year factory guarantee and lifetime technical support [1]

"1" Detailed data please refer to the " PARAMETERS" table .

Features & Benefits

Flexibility & Optimized Inventory

- Both model covers wattages from 1.5W to 57W and differs in lifespan
- Push-fit secondary terminals for LED module wires

Human Centric Design

- Easy & Quick connection with push-fit terminals and clip-on end cap for strain relief, super large wiring space
- Loop in & loop out function, max.2.5mm^2 cross section L, L, N, N, DA, DA,DA,DA stranded wire or solid wire
- Loose wiring inspection, no need to open the transparent end cap

Suitable for Emergency Lighting

- Suitable for Central Emergency System, CBS (central battery system)
- 50Hz and 0Hz(for emergency system)
- Suitable for emergency escape lighting systems according to EN 50172, LEDGEAR® can work with emergency DC voltage input, such as work with backup or emergency LED drivers(batteries).

Housing Properties

- Casing: polycarbonate, white
- Type of protection IP20

Typical applications

- For spot light and downlight in retail and hospitality applications
- For panel light and area light in office and education application

PARAMETERS

MODEL		C640-521050DB-FC	C655-521500DB-FC
Output	Output voltage	6-52V	6-52V
	Rated current	250 - 1050mA (preselected 250mA)	350 - 1500mA (preselected 350mA)
	Maximum power	40W	57W
	Current tolerance	±3%	±3%
	Ripple voltage [2]	150mVp-p	200mVp-p
	Ripple current	150mAp-p	200mAp-p
	Line regulation	±1%	±1%
	Load regulation	±3%	±3%
	Flicker percentage [2]	<3%	<3%
	Output P_ST_LM [3]	<0.8	<0.8
	Output SVM [3]	<0.3	<0.3
	Starting time	<500mS	<500mS
	Turn off time	<1.0S	<1.0S
	Noise	<22dB	<22dB
Input	Voltage	Rated:220-240V; Range:200-264V;	
	Frequency	Rated:50Hz, 0Hz; Range:47-53Hz, 0Hz;	
	Power factor	≥0.9; (Pout ≥ 15W)	≥0.9; (Pout ≥ 20W)
	I-THD [3]	<6%	<8%
	Efficiency [4]	≥88%	≥89%
	AC current	250mA max.	350mA max.
	Inrush current [5]	25A	30A
	Inrush current time	140uS	165uS
	Leakage current	<1mA	<1mA
	ON/OFF switches cycle	>100,000	>100,000
	Standby power	<0.35W	<0.35W
DALI & PUSH Control	Dimming control mode	Amplitude modulation dimming(AM)	
	Dimming control type	DALI DT6(1 channels dimming) & Push dimming	
	DALI Input Voltage	Rated:16V; Range:9.5-22.5V;	
	DALI Input (Bus) Current	Rated:1.6mA; Range:1.5-1.7mA;	
	Dimming Range	DALI-2: 0.1%-100%; PUSH: 0.5%-100%;	
	DALI Standard	IEC 62386-101:2014,IEC 62386-102:2014,IEC 62386-207:2009,IEC 62386-209:2009	

Protection	Over current		Constant current limiting, recovers automatically after fault condition is removed	
	Over voltage		Shut down output voltage, with auto-recovery or re-power on to recovery	
	Over temperature		Shut down output voltage, recovers automatically after temperature goes down	
	Short circuit		Constant current limiting, recovers automatically after fault condition is removed	
Safety & EMC	Safety standards		EN61347-2-13; Design refer to TUV EN60950-1, TUV EN61347-1;	
	Withstand voltage		I/P-O/P:3KVac I/P-FG:1.5KVac O/P-FG：500Vdc	
	Isolation resistance		I/P-O/P, I/P-FG, O/P-FG:100M Ohms/500Vdc/25℃/75%RH	
	EMC emission [6]		EN55015B, EN55022 Class B, EN61000-3-2, EN61000-3-3	
	EMC immunity		EN61000-4-2, EN61547, EN55024, EN-61000-4-5 Surge immunity Line-Earth: 2KV, L Line- N Line:1KV;	
Environment	Ambient temperature range[7]		-15°C ~ +50°C	-15°C ~ +50°C:Pout≤50W; -15°C ~ +45°C:Pout>50W;
	Max. case temperature(tc) [8]		90°C	90°C
	Relative humidity range		20% ~ 85%RH	20% ~ 85%RH
	Storage temperature range		-20°C ~ +80°C	-20°C ~ +80°C
max. No. of PSUS(Driver supply unit) on miniature circuit breaker(MCB)	MCB TYPE B	10A	26pcs @ Pout Max.	19pcs @ Pout Max
		16A	42pcs @ Pout Max	30pcs @ Pout Max
		20A	52pcs @ Pout Max	37pcs @ Pout Max
	MCB TYPE C	10A	30pcs @ Pout Max	22pcs @ Pout Max
		16A	48pcs @ Pout Max	34pcs @ Pout Max
		20A	60pcs @ Pout Max	43pcs @ Pout Max
	Lifetime(hrs)@tc=65°C		>60,000H	>60,000H
	MTBF [MIL-HDBK-217F(ta=25°C)]		412K Hrs min	436K Hrs min
	Glow wire test		850°C for 5S; 650°C for 30S	
	Dimension L x W x H		130.5 x 73 x 29.8mm	
	Warranty years		5 years	

(*If demand other output voltage and output current, contact your sales consultant or contact us: www.kinglumi.com)

"2" Ripple voltage is measured at 20MHz of bandwidth by using a 12'' twisted pair-wire terminated with a 100nF & 47uF parallel capacitor.

"3" Rated voltage input, rated output voltage and output current max.

"4" The typical efficiency is test data of output current at input @230Vac with 36V output voltage, maximum output current.

"5" The inrush current is test data of 230Vac input, cold start, measured at input current peak.

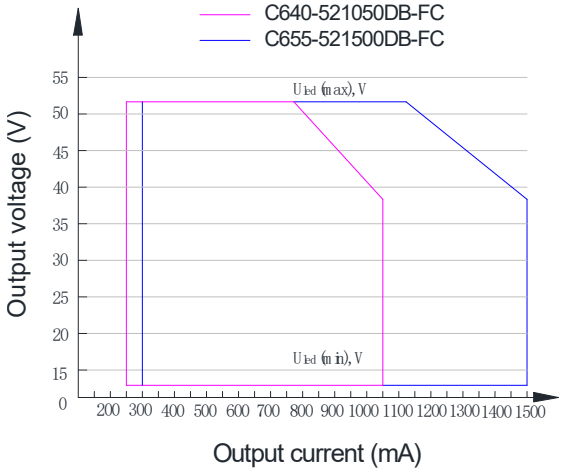
"6" The driver is considered as a component that will be operated in combination with final equipment. Since EMC performance will be affected by the complete installation, the final equipment manufacturers must re-qualify EMC directive on the complete installation again.

"7" For other than independent use, higher ta of the control gear possible as long as highest allowed tc point temperature is not exceeded.

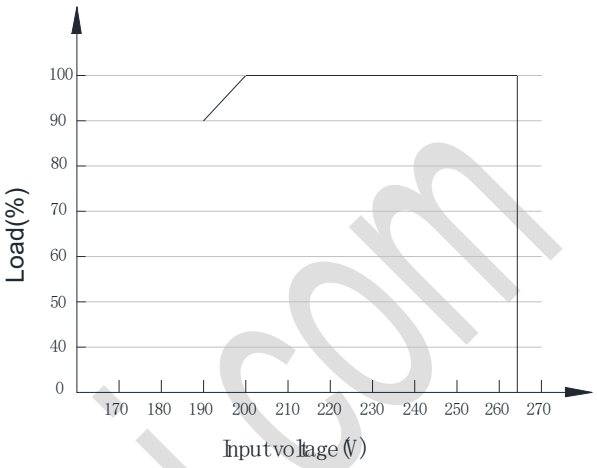
"8" The tc is defined as the highest permissible temperature which may occur on the outer surface of the power under normal operating conditions and at the rated voltage/current/power or the maximum of the rated voltage/current/power range, refer to “output power vs temperature” section.

DRIVER PERFORMANCE CURVE

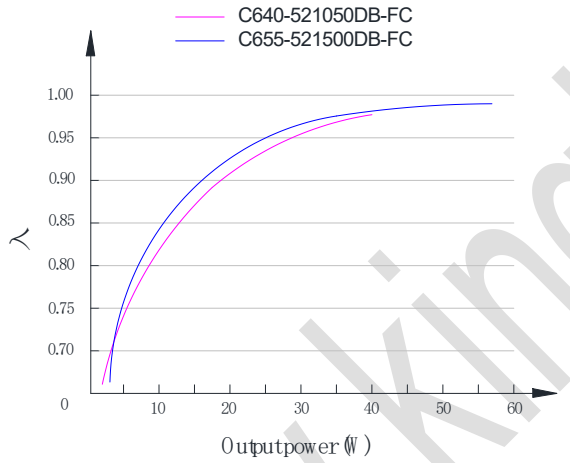
Operating window



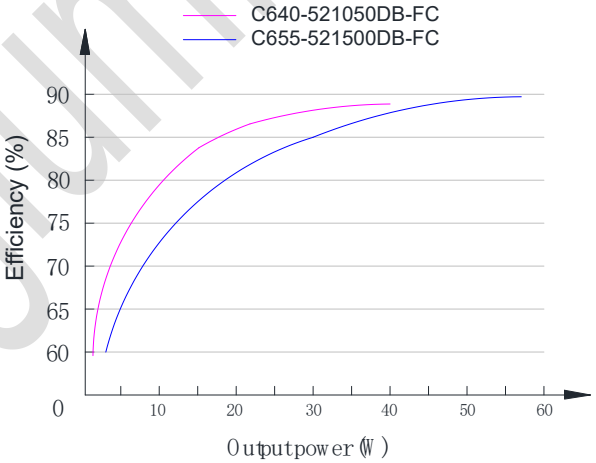
Typical load output



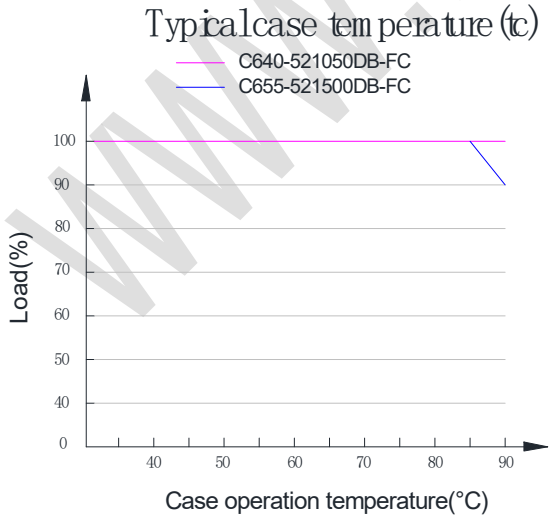
Typical power factor



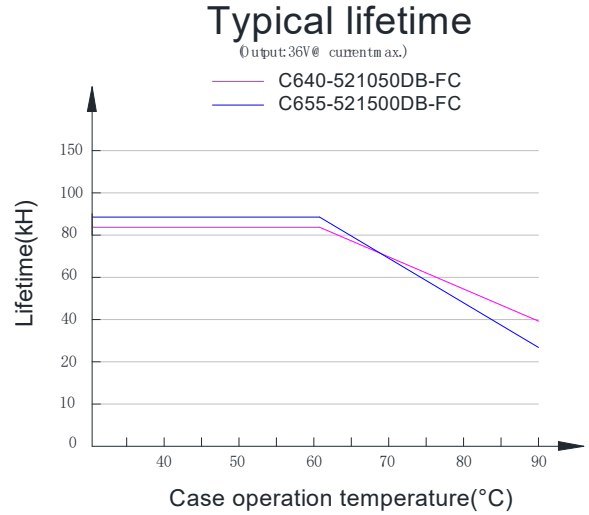
Typical efficiency



Typical case temperature (tc)



Typical lifetime

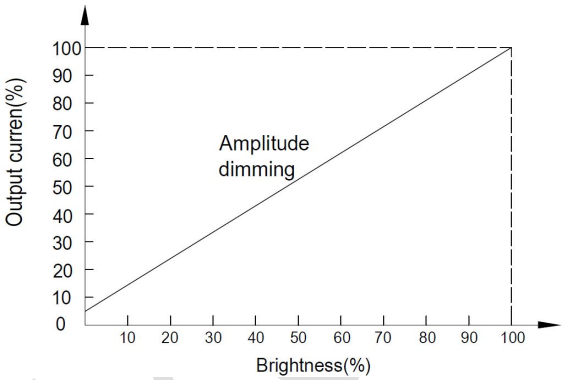


DIMMING OPERATION

Dimming type

Amplitude Modulation, short as "AM", also known as Constant Current Reduction(CCR) or Analog Dimming. The AM dimming is completely invisible when camera recording but on the other hand a possible LED colour shifting could occur at low level dimming, together with a possible LED light instability due to physical differences between LEDs.

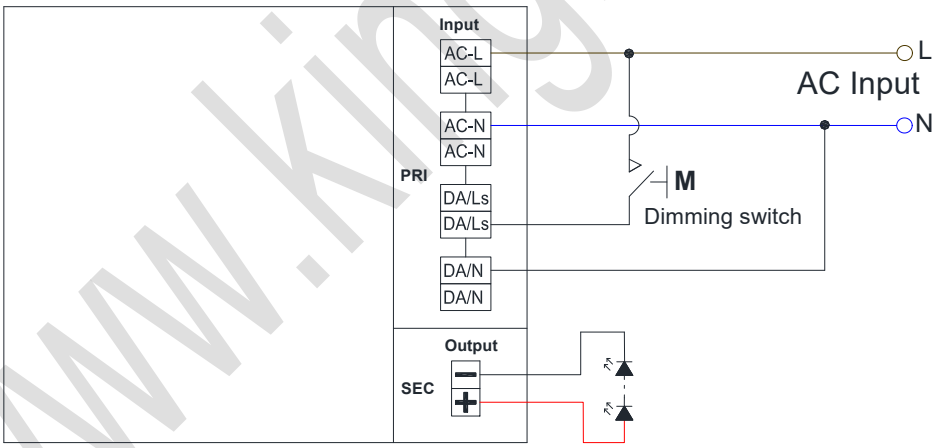
Kinglumi® ENHANCED amplitude dimming technology is realized by adjusting the reference voltage supplied to the LED Module. It has the advantage of no surge current and high efficiency. DIM-TO-WARM LED modules are compatible with AM dimming.



PUSH Dimming

PUSH-DIM, also known as Switch-Dim or Touch-Dim. To be able to make simple light management systems, the C6 driver also integrated PUSH-DIM Function. This makes it possible to dim and switch them directly with mains AC voltage using the PUSH control terminals (PUSH-DIM interface). Only one commercial push-button is required; the controller takes over the drivers. PUSH-DIM may never be used at the same time as a DALI control system.

Circuit diagram



Wiring and cable compensation

a) Do not use more than 20pcs C6 driver in a single PUSH-DIM application (up to 20 C6 Driver can be controlled by one push-button). The greater the number of C6 series driver controlled simultaneously, the greater the risk of asynchrony.

b) The cable length between the push-button and the farthest C6 series driver may not be longer than 105 meters. Compensation measures must be applied for line lengths required to be more than 105 meters long (bell transformer, resistance).

c) The push button can only be connected to the AC/L and PUSH terminals of the driver. It results in the short circuit if the Push Button is connected to the AC/N terminal.

Instructions

Operation	Action duration	Action
Ultra Short Press	<0.04 sec	Won't cause any action
Briefly Press	0.04-0.5 sec	Light ON/OFF
Press and hold at ON status	0.50-5.0sec	Brightness Dimming down to 0.5%, or up to 100%
Press and hold at OFF status	0.50-5.0sec	Brightness Dimming From 0.5% up to 100%
Long Press	>15.0 sec	Reset to factory settings(up to 50%)

Note:

a) Factory defaults 100% brightness, dimming level down to 0.5%.

b) Built--in with permanent memory:
Light returns to the previous dimming level when switched off and on again, even at power failure.

c) Synchronization of switching state and dimming direction:
For physical reasons, a PUSH-DIM system can work asynchronously; in other words, the switching state and dimming direction of the individual luminaires are different. The following steps are used to synchronize a PUSH-DIM system:
1. Step: Press and hold (> 0,5 s) → All luminaires switch on
2. Step: Press briefly (< 0,5 s) → All luminaires switch off
3. Step: Press and hold (> 0,5 s) → All luminaires switch on and dim

d) The PUSH-DIM wiring and the operator button must be rated for mains voltage (240 V).

e) Warning: Make sure the conduct core connected to PUSH terminal is not exposed, as it connected to the live wire.

Asynchronism

As a matter of principle, asynchronisms can occur with push-button operation in systems with more than one C6 driver. The higher the number of C6 Driver and the longer the control line length, the greater the chance of asynchronisms. In order to avoid lighting installations running asynchronously in practice, the permissible number of C6 series (20) and the total line length of 25 meters must be adhered to.

DALI 2 Dimming

The DALI logo, is only allowed to use for members of the DiiA. The LEDGEAR® C6 series is DALI-compliant to any DALI master or application controller if they bear the DALI logo.

Instructions

a) Compatible with both DALI-2 application controller or DALI-I master, please make sure they also qualified and listed in the DiiA website.

b) Connect the DALI signal to the DA1 and DA2 terminals (polarity-free)

c) Addressing possible:
- Individually (max. 64 IP addresses)
- In groups (max. 16)
- All together

d) The least dimming depth of DALI is of 0.1% * Iout.

e) Built-in with permanent memory: light returns to the previous dimming level when switched off and on again, even at power failure.

f) Supports star, tree, serial, parallel wiring ,but not supports ring wiring

g) If the C6 series are not reacting to the command of the control unit. Please inspect the wiring; approx. 16 V DC must be applied to the DALI terminal of the C6 series.

DALI INPUT	MIN	TYP	MAX
High level	9.5V	16V	22.5V
Low level	-6.5V	0	6.5V

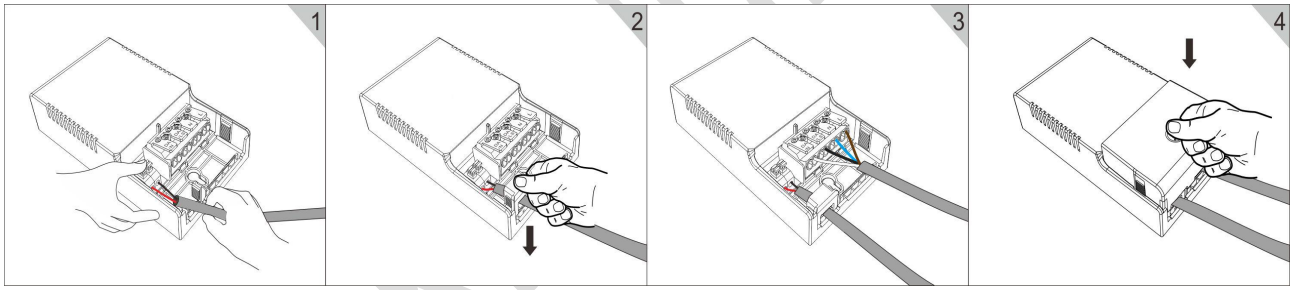
h) DALI bus communication length and input wire diameter

Wire Diameter	DALI Bus Communication length
0.5 ^{2} mm	100m Max.
0.75 ^{2} mm	150m Max.
1.0 ^{2} mm	200m Max.
≥1.5 ^{2} mm	300m Max.

DIAGRAM&INSTALLATION MANUAL

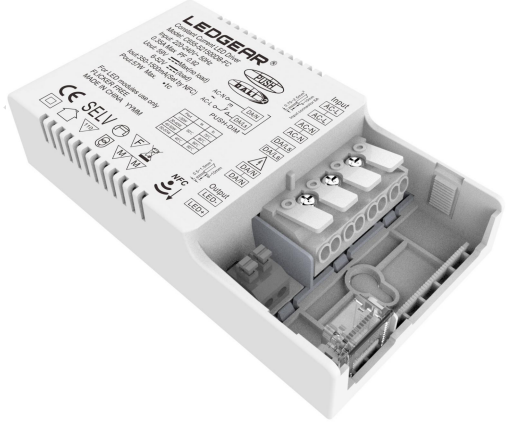
Release of the wiring

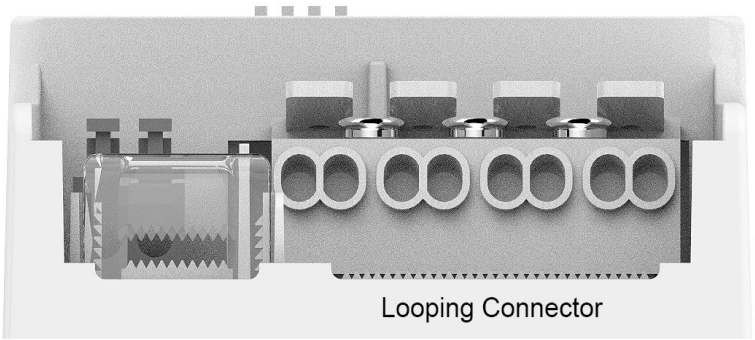
Press down the “push button” and remove the cable from front.

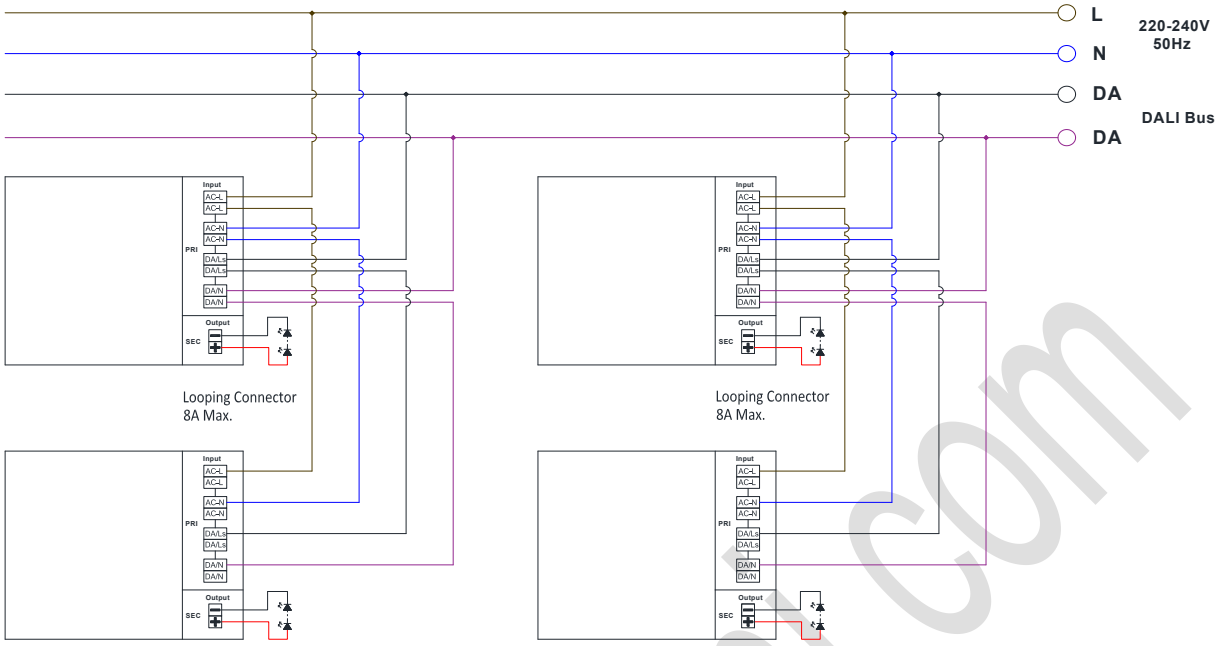


Looping Circuit diagram

These LEDGEAR® drivers provides "through wiring functions" at primary for the L,N input and DALI1,DALI2, which allows quick looping from driver to driver and save the installation time.

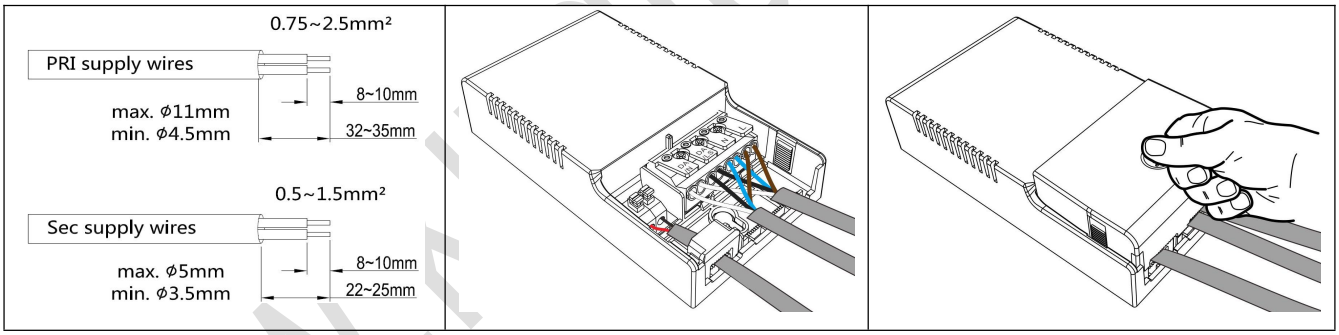



Looping Connector



Wiring type and cross section

The wiring can be in stranded wires with ferrules or solid with a cross section of 0.75–2.5 mm². Strip 8-10mm of insulation from the cables to ensure perfect operation of the push-wire terminals. Use one wire for each terminal connector only



Wiring guidelines

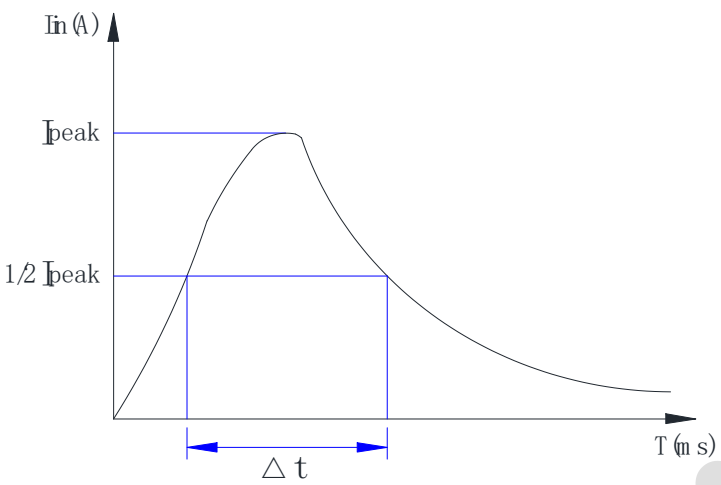
- All connections must be kept as short as possible to ensure good EMI behavior.
- Mains leads should be kept apart from LED Driver and other leads (ideally 10 – 30 cm distance).
- Incorrect wiring can damage LED modules.
- The wiring must be protected against short circuits to earth (sharp edged metal parts, metal cable clips, louver, etc.

Miniature circuit breaker application

Total continuous current of the drivers and installation environment must always be considered and taken into calculations when installing drivers behind miniature circuit breaker(MCB).

Quantity of drivers(36V@1500mA Output) per miniature circuit breaker 16 A Type C

Based on inrush current Ipeak	Typ. peak inrush current Ipeak	1/2 value time, Δt	Calculated energy, Ipeak ² Δt
38pcs	30A	280uS	0.252A²s

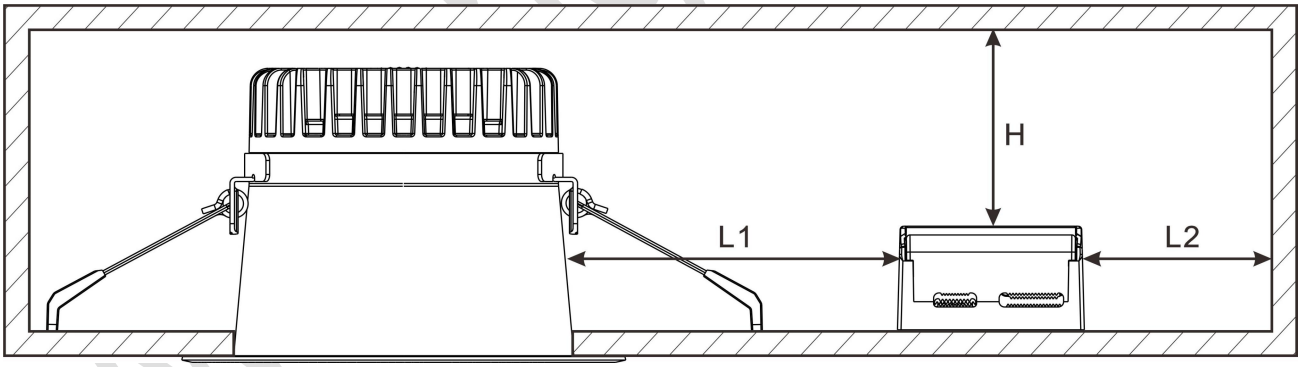


Example calculation of total drivers amount limited by continuous current: n(Icont) = (16 A (Inom, ta) / "nominal mains current with full load") x 0.75). This calculation is an example according to recommended precautions due to multiple adjacent circuit breakers (> 9 MCBs) and installation environment (ta=30°C); variables may vary according to the use case. Both inrush current and continuous current calculations are based on "Schneider Acti9" series circuit breakers. More specific information in "Schneider Acti9" series circuit breaker documentation.

NOTE ! Type B or C MCB's are strongly recommended to use with the LED driver.

Fixing conditions

Dry, acid-free, oil-free, fat-free. It is not allowed to exceed the maximum ambient temperature (ta) stated on the device. Minimum distances stated below are recommendations and depend on the actual luminaire. Is not suitable for fixing in corner.



Size / Model	L1(min.)	L2(min.)	H(min.)
C640-521050DB-FC	120mm	30mm	20mm
C655-521500DB-FC	150mm	50mm	30mm

NFC setup guide

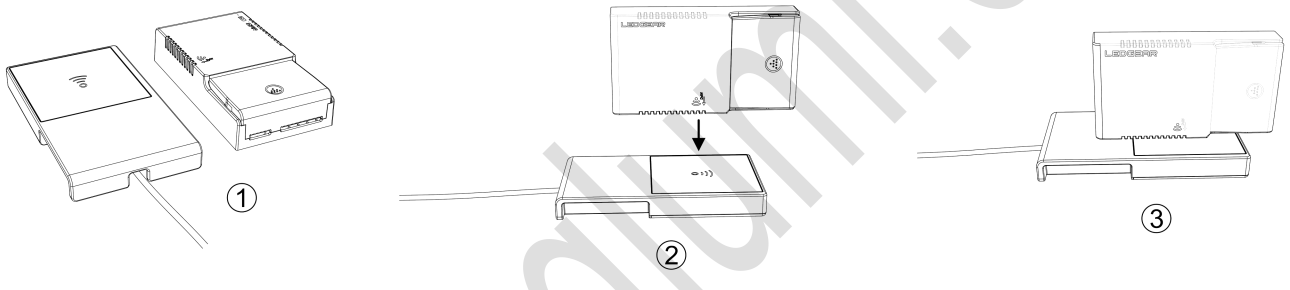
1. Computer & System Requirement:

Processor: 1GHz or higher
RAM: 1GB or more
Hard disk: 20GB or more
Peripherals: Mouse, keyboard
Operating system: Windows 7 or later, 64-bit
Required environment: Microsoft .Net Framework 4.6 or higher

2. NFC Read & Write Devices Requirement(Either):

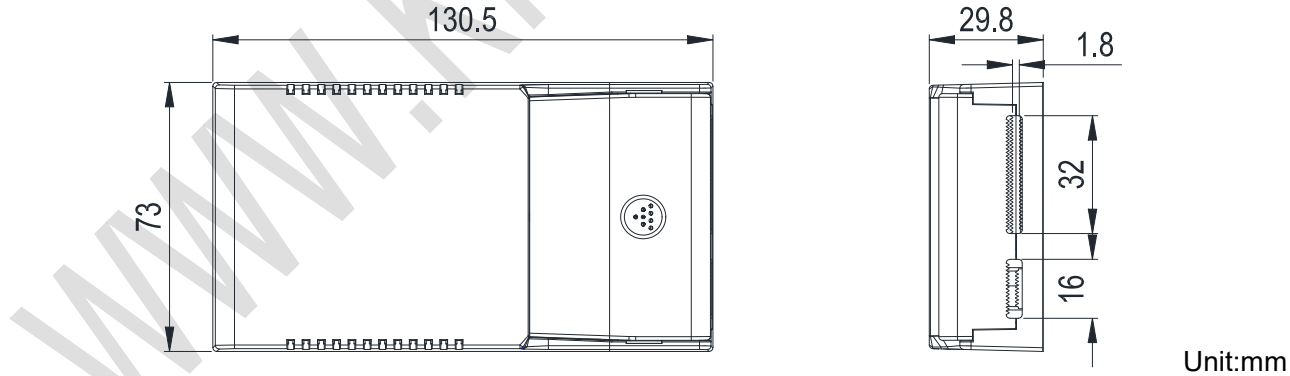
NFC Program Devices	Description	Manufacturer
ID CPR30+	Desktop Programmer	FEIG ELECTRONIC GmbH
ID ISC.PRH101-USB	Handheld Programmer	FEIG ELECTRONIC GmbH

3. LEDGEAR NFC Setup Software



*** Aks our sales for the software !**

MECHANICAL



PACKAGING

Part Number	Dimension	Gross Weight	Net Weight	Qty/Carton
C640-521050DB-FC	510x330x205mm	11.5kg	9.5kg	50pcs
C655-521500DB-FC	510x330x205mm	12kg	10kg	50pcs

VERSION #

#	MODIFICATIONS	Date.
1	Version 1	2024.05.20
2		
3		
4		
5		
6		
7		
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10		
11		
12		