

Speaker:

Wen Wu, 28/Apr/2021



2 main stream Product Lines



Main Stream

MEAN WELL is regarded as the power brand with the most complete product lines. Two main product lines, Enclosed type and LED driver product lines are the fundamental support for decades of operation and growth, and further consolidate our global leading position in Product Lines Standard Power Supply.



Enclosed Type



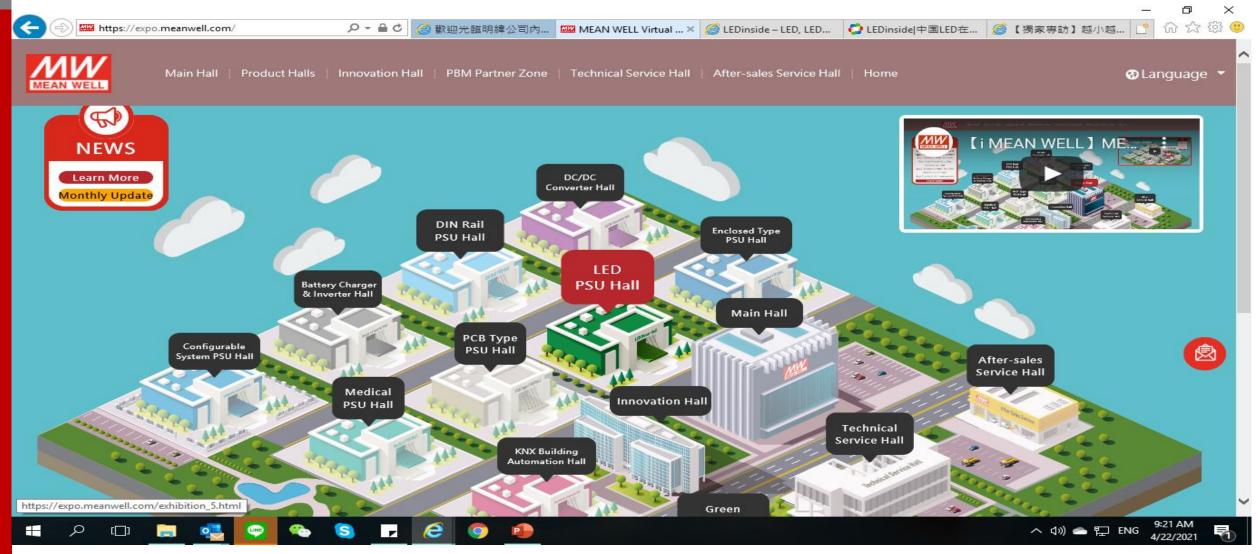
LED Driver





On-line Expo - LED Driver Hall





https://expo.meanwell.com/aboutRange.aspx?i=23

LED product market trend



Agriculture application

- a. Horticulture lighting
- b. Poultry lighting

UV LED application

- a. UV-A for ink and coating Curing process
- b. UV-B for skin treatment
- c. UV-C for any sterilization application

Digital lighting system(Building Automation)

- a. Intelligent lighting control (Casambi/Tuya.....)
- b. DALI-2 digital lighting system(DALI-2/D4I.....)
- c. KNX Building automation system

DC House –DC bus application

a. DC centralized bus (DC 48V or DC 380V)

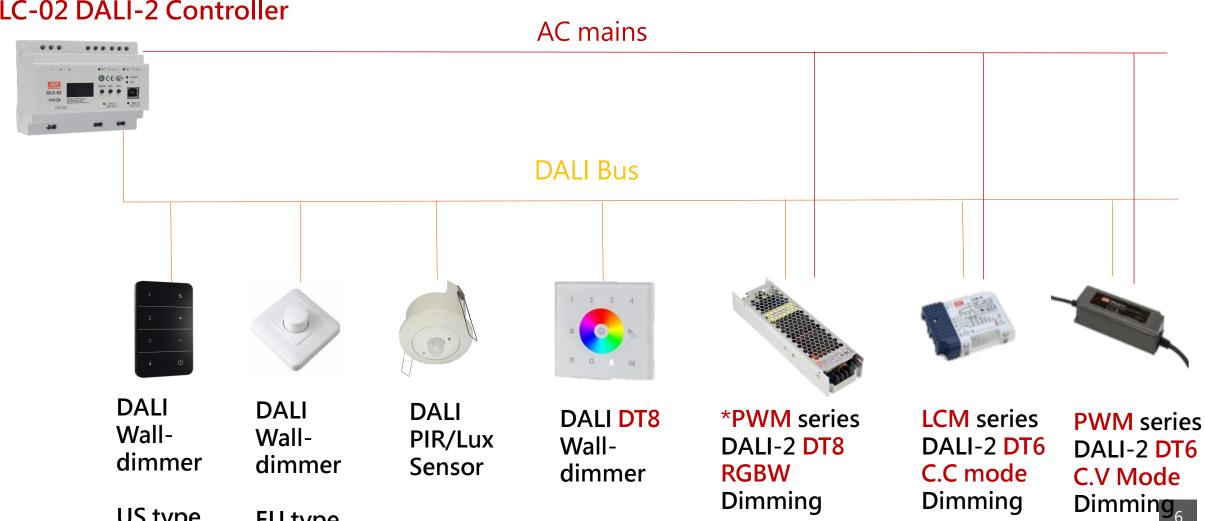
DALI-2 Digital lighting system(B.A)



DLC-02 DALI-2 Controller

US type

EU type



DALI-2-Part 209 DT8 (RGBW) color control GROUP MEAN WELL





Which casing?

Power supply + RGBW PWM control =

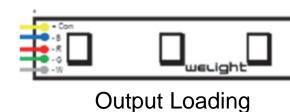
Which wattage?





U Bracket type







Plastic housing type

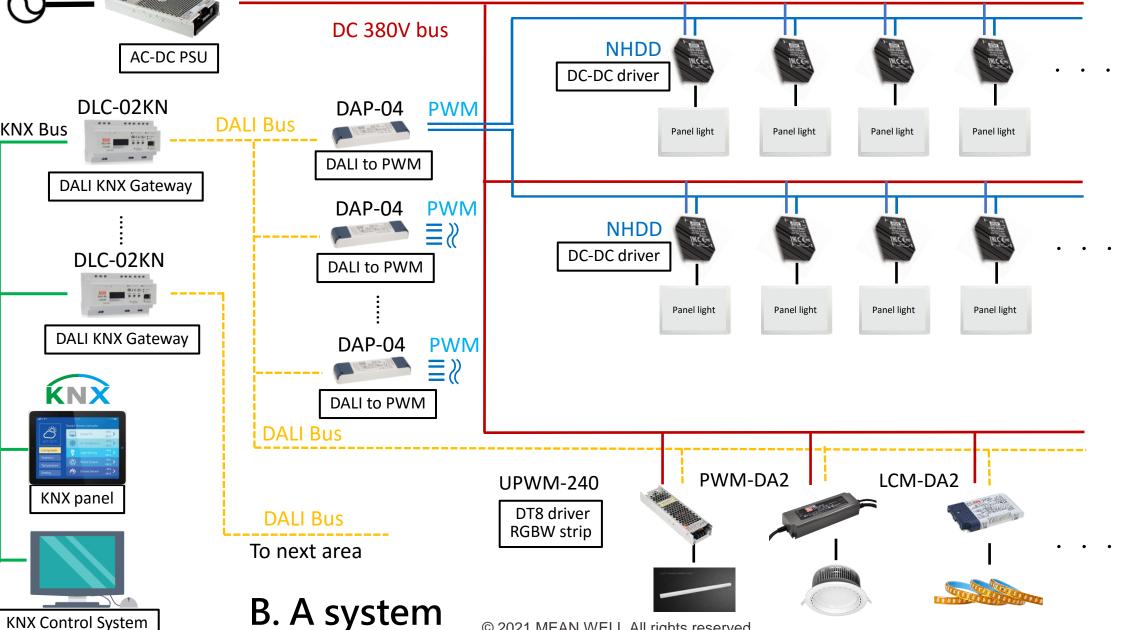


Terminal type



DC Centralized lighting system AC input UHP-1500-HV DC 380V bus **NHDD AC-DC PSU** DC-DC driver DLC-02KN DAP-04 **PWM DALI Bus KNX Bus** Panel light Panel light Panel light Panel light





Mobile APP Revision



Update Highlights



Up to 15 News



Quick SPEC Search



Add Category Video



Android Google Play

Plastic casing

LED Driver Category

Metal casing



Marie Carrier	Non-PFC –Plastic Housing APV/APC/LPV/LPC Series 8W ~ 150W Non-PFC-Metal housing ERP-200/350/400W		PFC-Metal Housing FDL Series 65/80/100W	
	PFC –Plastic Housing with cable PLN/ODLV/ODLC/PLD/PCD/HLN/GSC /LPF/NPF/PWM/OWA Series 16W~ 200W		PFC-Metal Housing ELG/ELGC Series 50~300W XLG Series 25/50/75/100/150/200/240W	
	PFC –Plastic housing with Terminal block PLM/PLC/IDLV/IDLC/LCM/ LDC/SLD- 50/80 Linear Series 12W~100W.		PFC-Metal Housing HVG/HVGC Series 65~1000W	
	PFC –Open frame type PLP/HLP/IDPV/IDPC/HBGP 20~ 240W	A STATE OF THE PARTY OF THE PAR	PFC-Metal Housing HLG/HLGC Series 40 ~600W	
	DC-DC type-Plastic housing LDD/NLDD/LDDS/LDB/LDH Series 9W~65W		PFC-Circular type HBG/HBGC Series 60~300W	
Section 1997 And 1997	Building Automation System DALI-2 Controller DLC-02 / DLC-02-KN © 2021 MEAN WELL A		XBG-100/160/240 Series.	



NLDD-H Series LDDS-H Series

Centralized DC bus-DC-DC LED Driver

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NLDD-H/LDDS-H Key Features



- NLDD-H/LDDS-H series for step-down application
- Output wide driving range design
- Pin or wire style for selection (NLDD-H)
- With 0-10V/PWM dimming function (LDDS-H)
- Comply with EN61347/EN55015 certification
- Meet SELV(Class III) luminaire regulation





NLDD-H(32*20.5*12.5)



LDDS-H (47*12*7mm Slim)

Step-down DC-DC LED Application



(NLDD-H/HW series)

- 10~56V DC input
- 24V/48V DC Bus
- DC Bus lighting using







Step-down DC-DC LED Application



(LDDS-HW/HWB series)

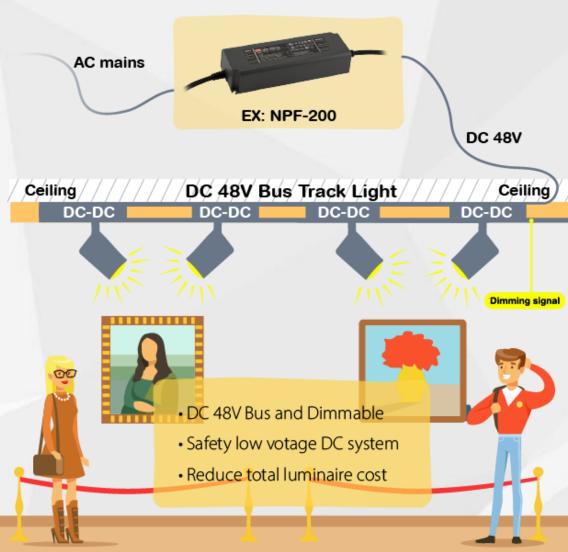
Track case







- 12~56V DC input
- 24V/48V DC bus
- DC Bus lighting using



Wide driving range Application



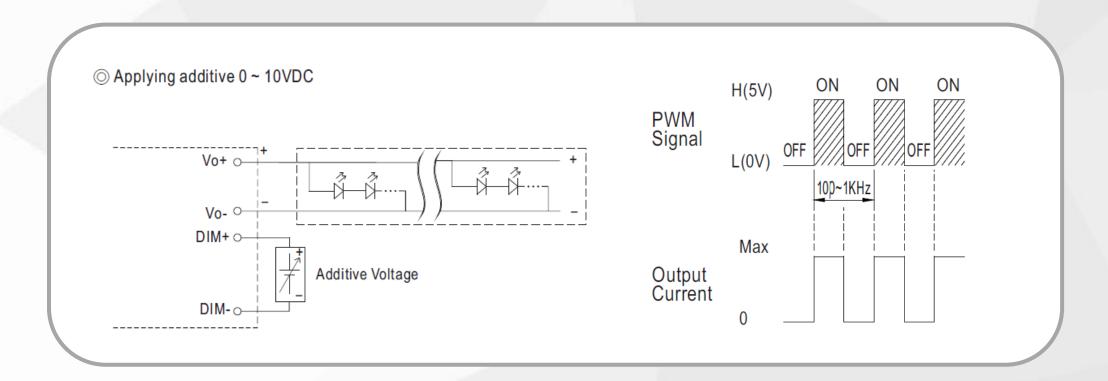
- To drive SMD LED in series/parallel or COB LED
- Compact design · place it in any luminaire

Series	Output Voltage range	Output current Range
NLDD-H/HW	6~52 V	350/500/700/1050/1200/1400 mA
LDDS-HW/HWB	2~45 V	250/300/350/500/700/1000 mA

Dimmable Design

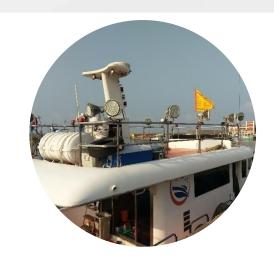


- With wireless controller via PWM signal for dimming (NLDD-H/HW)
- With common 0-10V/PWM controller for dimming (LDDS-HWB)









- Bus/Camper lighting
- Yacht lighting
- Portable luminaire



- DC 24/48V Track light
- DC House DC lighting
- DC centralized power for greenhouse lighting



200W Class II Plastic Housing PSU Features



PWM-200



- Constant voltage output, suitable for LED strip application
- With 3 in 1 or DALI 2.0+ Push **Dim or KNX** dimming function
- Flicker free design compliant IEEE1789-2015 up to 4K HZ
- Complete lighting safety EN61347/UL8750/GB19510

NPF-200



- Constant voltage + Constant current output, suitable for LED strip or LED lamp application
- With linear constant voltage dimming function, flicker free design, suitable for poultry lighting
- Complete lighting safety EN61347/UL8750/GB19510

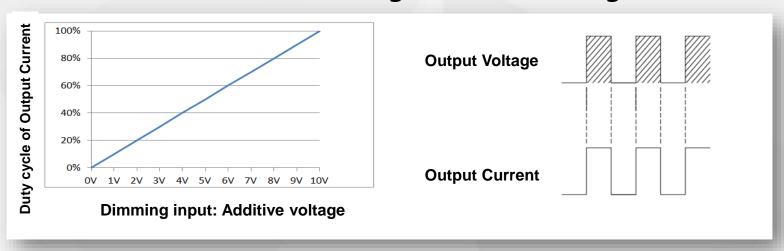


- Constant voltage output, suitable for general electrical and industrial appliances.
- Comply with Energy star level VI and CoC V5 Tier 2 energy regulation
- US type: Comply with UL 62368-1 listed ITE product safety
- EU type: Comply with EN61558 / EN60335 Industrial and household appliance product safety
- Class II, Comply with SELV and primary and secondary isolation design
- Fully potted design, comply with IP67 Waterproof and dustproof test(except for KN models)
- Release Date: Apr/2021, May for KNX type

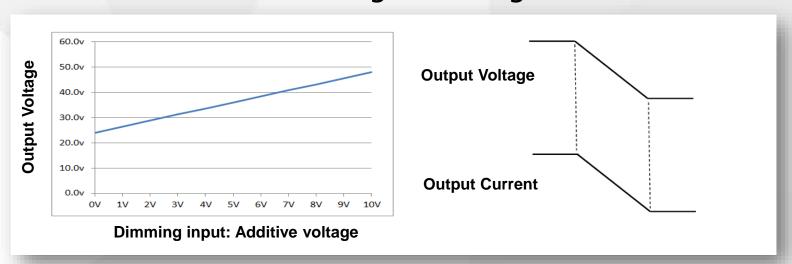
NPF-200 Linear Voltage dimming flicker free



Traditional constant voltage PWM dimming



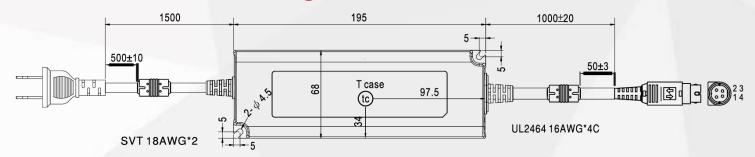
Linear constant voltage dimming NPF-200V



OWA-200 Wire Comparison



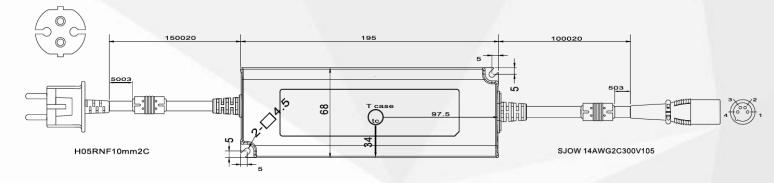
OWA-200U—U.S.A Plug 110~264 V AC



All models: power DIN 4 pins with lock type, KYCON KPPX-4P, or equivalent

Standard	plug: R7B			
	23		PIN NO.	OUTPUT
	1 4		1,4	+V
		KYCON KPPX-4P equivalent	2,3	-V

OWA-200E—EU Plug 180~264 V AC



Plug Picture	PIN NO.	OUTPUT
3 2	1,2	+V
4(00)1	3,4	-V

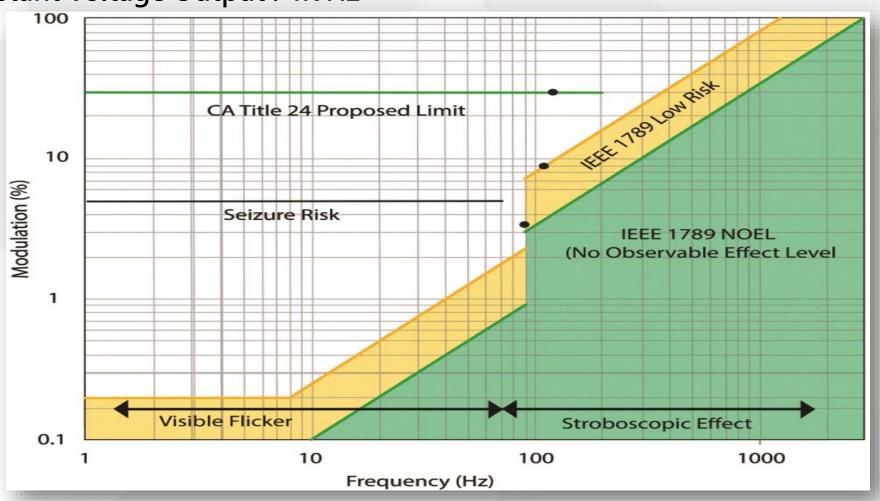
OWA-200—DC Output M15/M19 Waterproof connector option available





PWM-200 meets IEEE 1789-2015 (No Flicker Risk)

PWM Constant Voltage Output: 4K Hz



What is KNX Data Secure?



KNX Data Secure signs and encrypts the communication telegrams in the KNX bus network to avoid unauthorized access or manipulation.

Therefore, KNX Secure products can prevent hacker attack scenarios, such as communication content (sniffing), repeated communication (replay attack) or tampering (man in the middle attack).

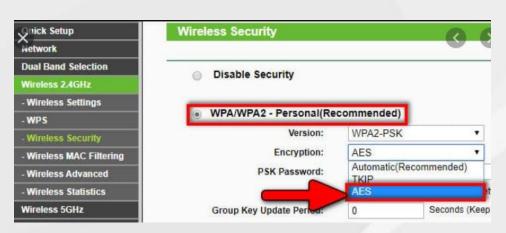


What is the security level used in KNX Data Secure?

Based on ISO 18033-3 standardized security algorithm, AES 128-bit encryption.

AES encryption is commonly used in Wi-Fi router router->

Additional information: Other communications of MW products such as DALI, PMBus, CANBus are not encrypted



What is Device certificate?



Device certificate is a 36-character string. The purpose is to enable Data Secure on ETS for the first time. Therefore, ETS will first read the device certificate and use the built-in camera of the laptop to read the QR code (no need to type) and import to ETS

The device certificate is an easy-to-remove label placed on the front of the device. After installation, the label must be removed from the device and stored safely to prevent unauthorized personnel from obtaining it to avoid information security crisis



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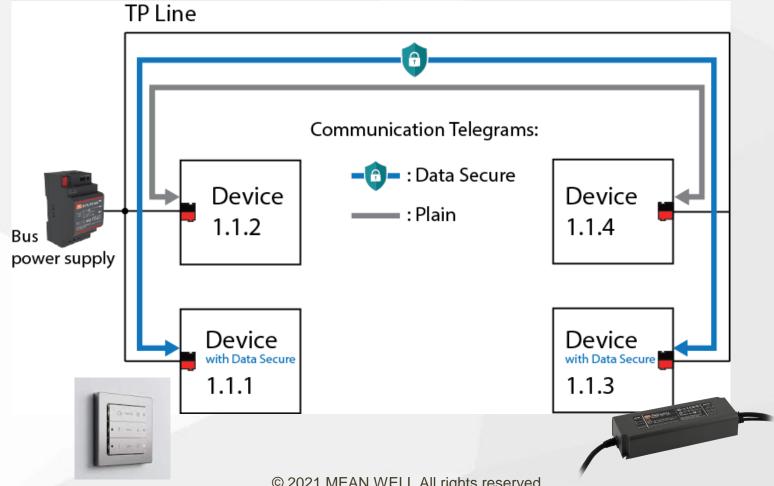
AFROO4-HWZ3JO K4YDZN-WTILLR 4OBU7Y-3IVXYR



Can PWM-200KN only be installed in a full Secure system?



No, in addition to being installed in all new installation systems that use Data Secure, it can also be used in an installed traditional KNX system for upgrading.



Is it possible to disable the secure function for PWM-200KN?

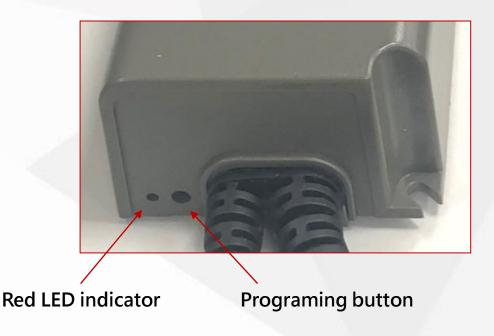


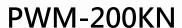
Yes, user only need to set the secure commissioning to "Deactivated" in the ETS application database of and the device with KNX Data Secure will be configured just like a traditional KNX device. The behavior is the same as that of devices without KNX Data Secure, which means that KNX Data Secure devices can also be used in existing systems, such as replacing damaged devices.

Individual Address		_	
	1.1	1 7	Park
Description			
Last Modified	24/02/2021 17:0)4	
Last Modified Last Downloaded Serial Number	03/02/2021 14:1		
Last Downloaded	03/02/2021 14:1		
Last Downloaded Serial Number	03/02/2021 14:1 0162:6E83E1D9		
Last Downloaded	03/02/2021 14:1 0162:6E83E1D9		

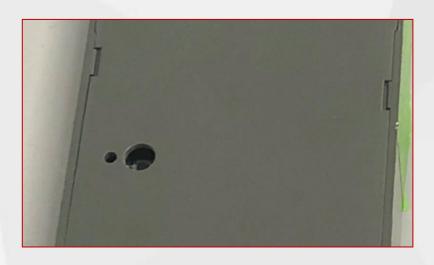
KNX LED driver programming button position comparison







Programming button is on the side
No need to disassemble the power supply
when re-addressing is required
More convenient to use



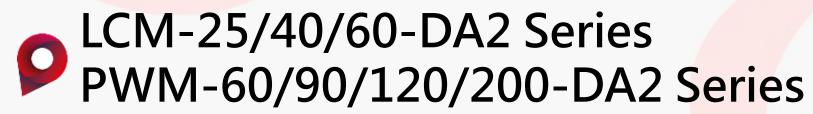
PWM-60/120KN is at the bottom

200W Class II Plastic Housing PSU Certification and Application



Series	Safety standard	Application industry	Application Figure
PWM-200	EN61347 UL8750	-LED strip -LED decorative lighting -Advertising light box	
NPF-200(V)	GB19510	-LED strip -LED poultry lighting -LED decorative lighting -LED luminaire	Agricultural Lighting
OWA-200 (UL listed)	U type: EN62368-1 E type: EN61558 EN60335	-loT field PC adaptor -POS/Kiosk system -Small-Cell base station -Charger for electric lawn mower/robot vacuum/ robot carrier	





DALI-2 Digital Dimming LED Driver





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LCM Series







- Constant current output(C.C mode), suitable for lamps, support emergency lighting (EL)
- Push Dim and synchronous dimming function up to 10 units
- Constant voltage output (C.V mode), suitable for LED strip application, support emergency lighting (EL)
- Fully potted design, comply with IP67
 Waterproof and dustproof test
- DALI-2 control/dimmable/group setting/wall switch, sensor support
- Class II, Comply with SELV and primary and secondary isolation design
- Independent control gear





Comply with IEC62386 DALI-2 Product

- Comply with IEC62386-101/102/207/251 standard, can control lamp dimming and scenario setting
- Can be integrated with DALI-2 certified product such as wall switch or sensor for complete lighting design

Driving Mode	Old DALI version	DALI-2 Version	Function Description
Constant Current Mode(C.C mode)	LCM- 025DA	LCM- 025DA2	350~1050 m A dimmable Push Dim dimming
	LCM- 040DA	LCM- 040DA2	350~1050 m A dimmable Push Dim dimming
	LCM- 060DA	LCM- 060DA2	500~1400 m A dimmable Push Dim dimming
	PWM- 060DA	PWM- 060DA2	12V/24V output
	PWM- 090DA	PWM- 090DA2	12V/24V/48V output
Constant Voltage Mode(C.V mode)	PWM- 120DA	PWM- 120DA2	12V/24V output
		PWM- 200DA2	12/24/36/48V output Release date: Apr/2021

C.C Mode, for lamp direct driving





LCM-25/40/60W series is constant current output driver with DALI-2 function, can driver LED module directly

- · 0-10V
- · PWM
- · Resistance
- · Push Dimming
- · DALI / DALI 2.0

- · EnOcean
- · KNX
- · PIR
- · Bluetooth Mesh
- · WiFi.....and so on



C.V Mode, for LED Strip driving





PWM-60/90/120/200W series is constant voltage output driver · with DALI-2 function, can drive LED strip directly.

- · 0-10V
- · PWM
- · Resistance
- · Push Dimming

- · DALI / DALI 2.0
- · KNX
- · Bluetooth Mesh
- · WiFi.....and so on



LCM/PWM-DA2 Series Application

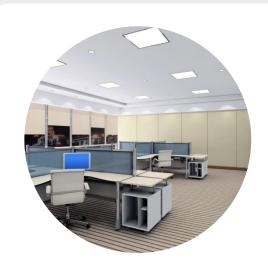


LCM-25/40/60-DA2 Series



Commercial lighting

- Downlight
- Recessed lighting
- Ceiling lights



Office lighting

- Panel light
- T-bar light

PWM-60/90/120/200-DA2 Series



Decorative lighting

- Linear light
- Indirect lighting



Advertising lighting

- Light box backlight
- LED strip application



DALI-2 Controller / KNX Gateway DLC-02 Product Introduction

Digital building lighting system





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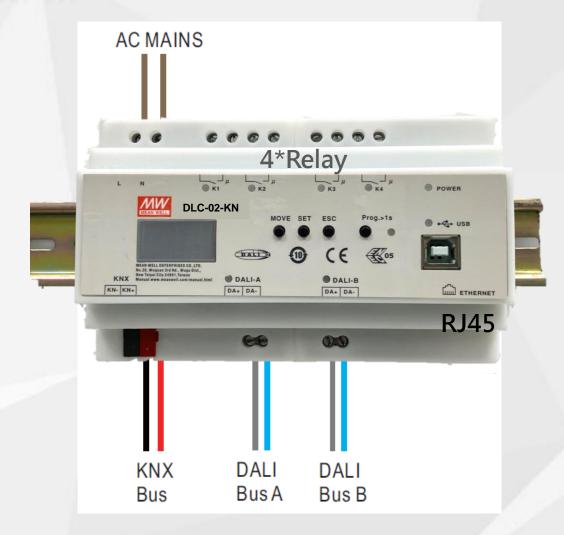
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DLC-02 Key Features



- Comply with IEC 62386 DALI-2 ,Part 101/Part 103
- 2 independent DALI bus, can be connected to Control Gear and Control Device for Application
- 4 programmable relays, can be used as an electrical switch or two sets of electric curtains
- Can be used with DLC software for on-site system settings or remotely through network to modify settings
- Built-in LCD display and control buttons to set and view settings
- Built-in timer IC, commission schedule can be set through DLC software
- Communication interface: RJ-45 and KNX(No Data secure) for connection expansion with other building automation systems
- Din-rail, compact design 8SU width(140*90*58.4mm)
- Release date : Jun/2021



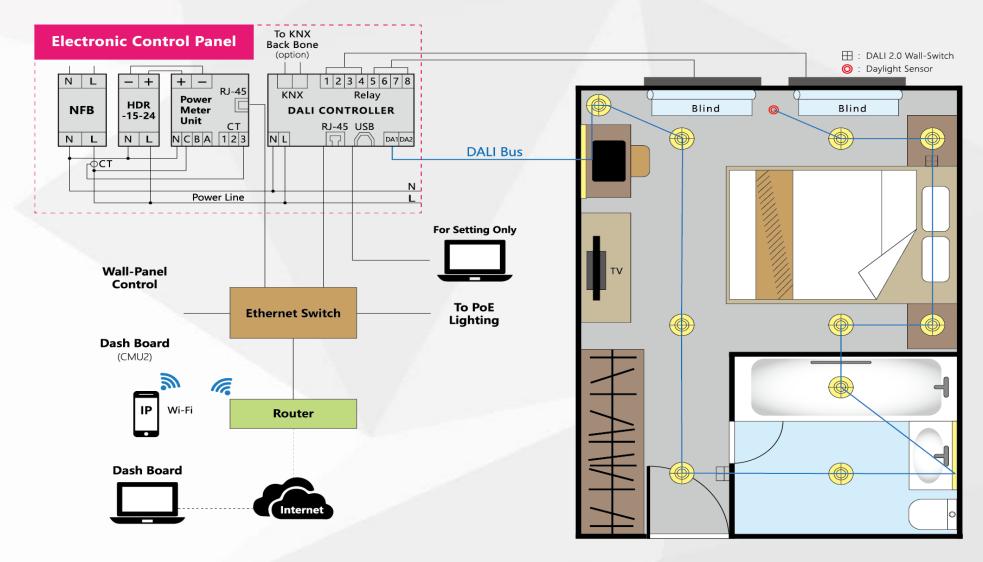




Model	DLC-02 / DLC-02-KN	
Electrical specifications and communication interface		
Input Voltage	100 ~ 305VAC · class II (2.5 mm ² max.)	
Frequency Range	47 ~ 63Hz	
Output Voltage (DALI Bus)	2*16V DC Bus (2.5 mm ²)	
Output Current (DALI Bus)	2* 250mA	
Rated Power	15W	
Working Temperature	-20~50°C	
Relay contact capacity	4×5A Relay (Normal open) (2.5 mm ²)	
Communication Interface	RJ45 *1 Ethernet IP/USB- type B *1/KNX (No support for Data secure)*1	
LED Indicator	Power indicator*1/ Relay status indicator*4/ DALI bus indicator*2 /USB indicator*1	
LCD Screen	With control buttons to set and view settings	
Installation	DIN-RAIL DIN 43880 35mm	
Dimension	140*90*58.4 mm (8SU Step shape)	
Warranty	5 Years /50,000 hrs.	
DALI specifications		
Number of connected lamps	Up to 64 individual DALI-2 Control gear can be connected in a DALI segment, total 2*64	
Number of connected Input devices (DLC-02)	Up to 12 individual DALI-2 Input device can be connected in a DALI segment, total 2*12	
Scene/group	Each DALI bus can have 16 scenes and 16 groups	
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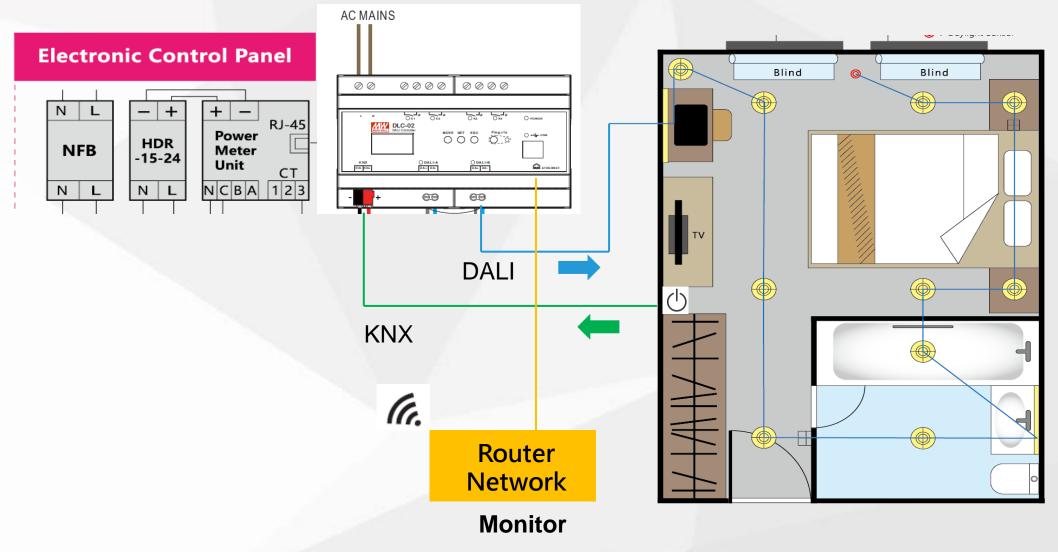
Application-Hotel Room Lighting











Application-Luxury Apartments Indoor Lighting

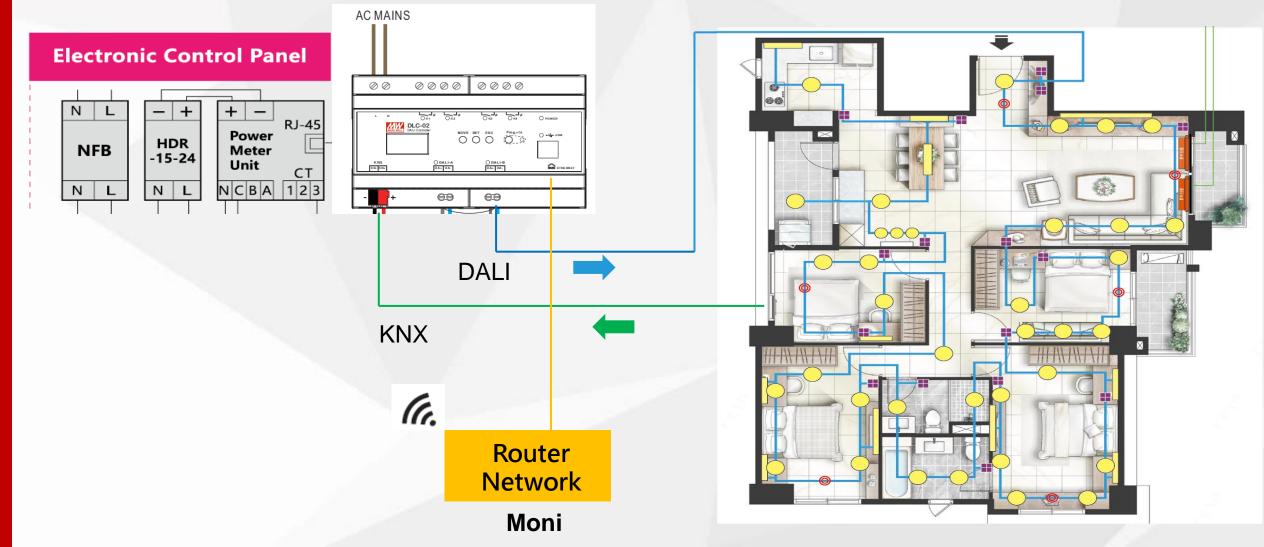




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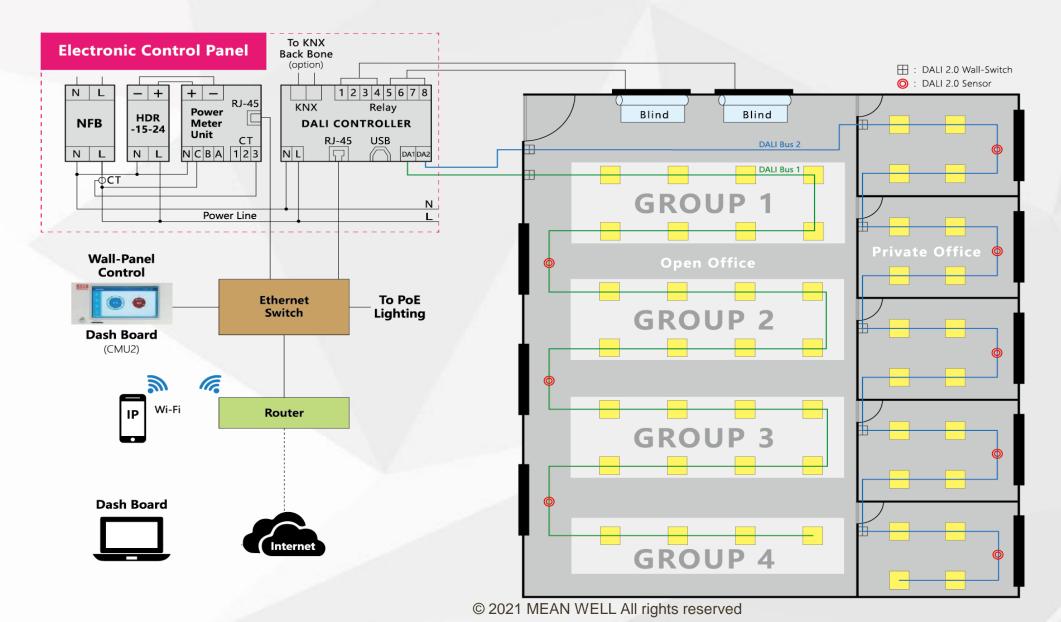
Application-Luxury Apartments Indoor Lighting (KNX)





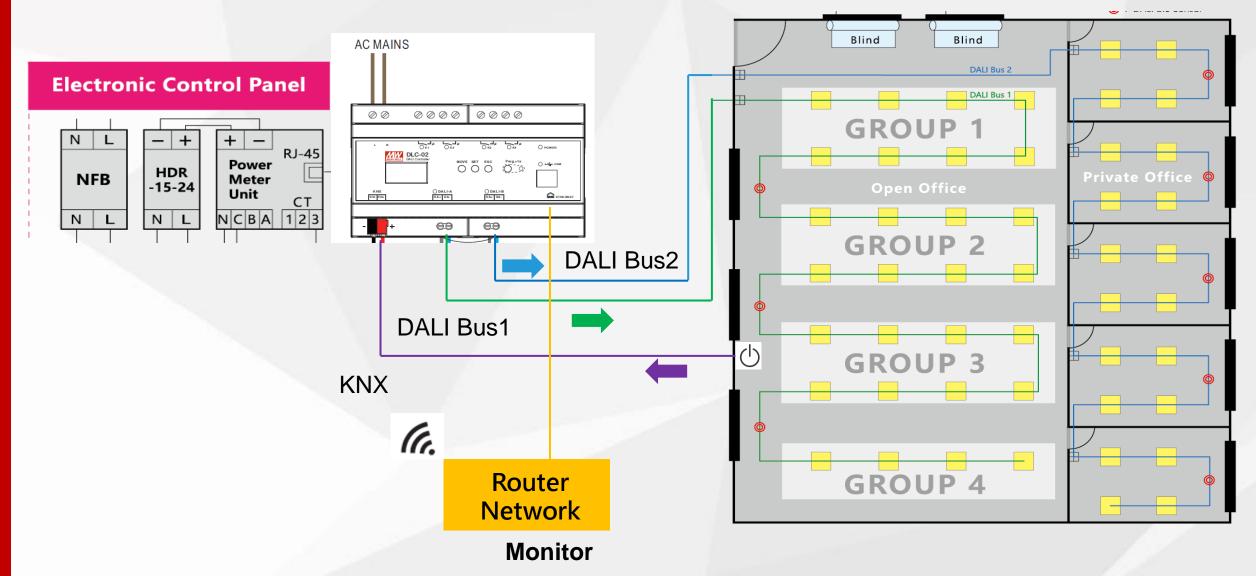
Application-Office lighting-Case 1





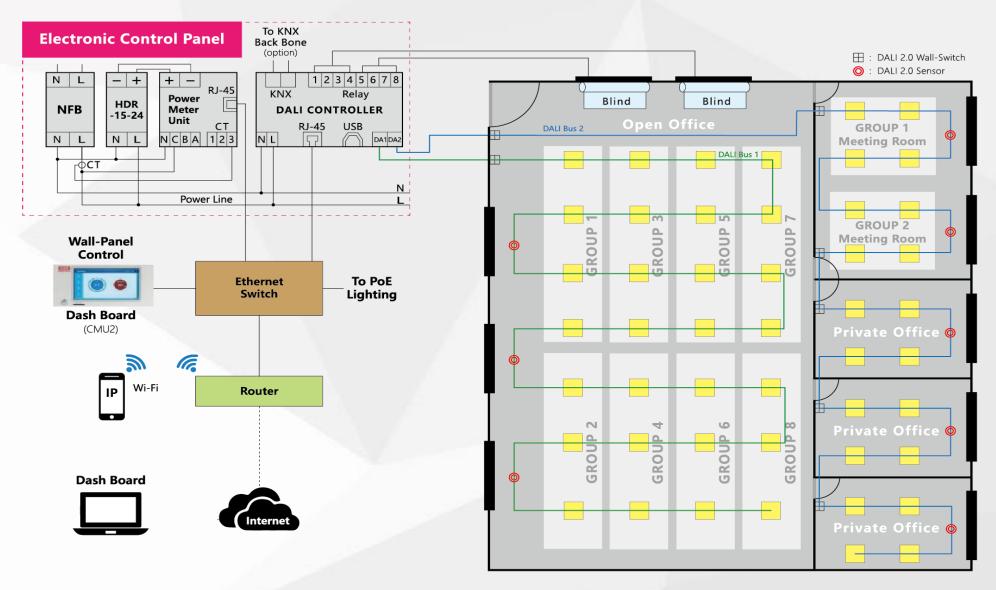
Application-Office lighting-Case 1 (KNX)





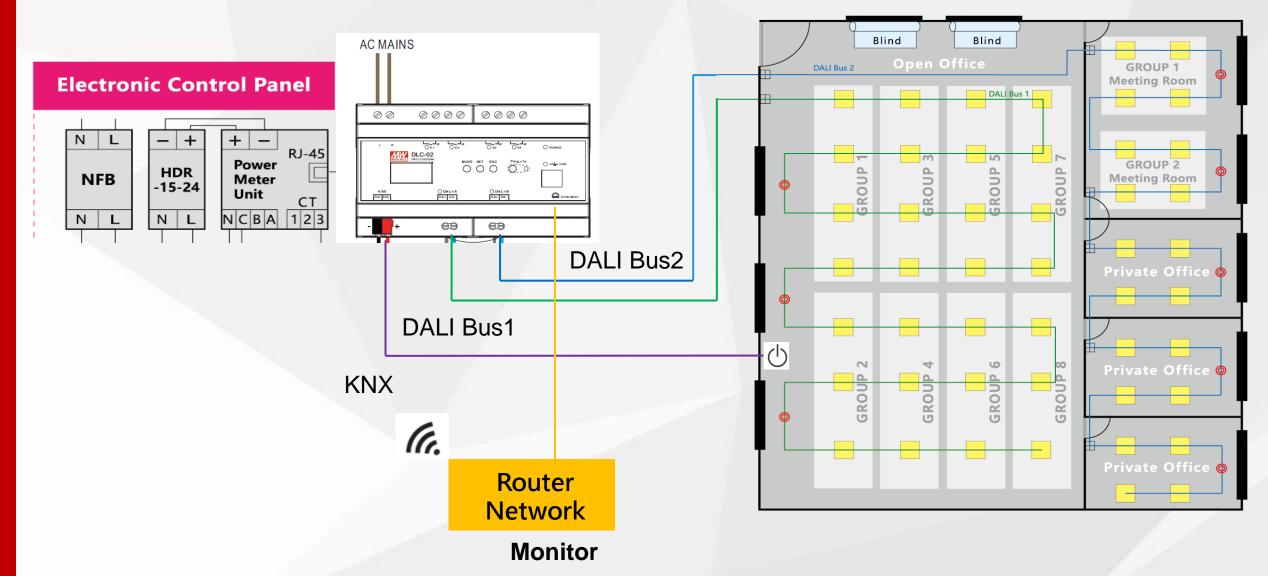
Application-Office lighting-Case 2





Application-Office lighting-Case 2 (KNX)

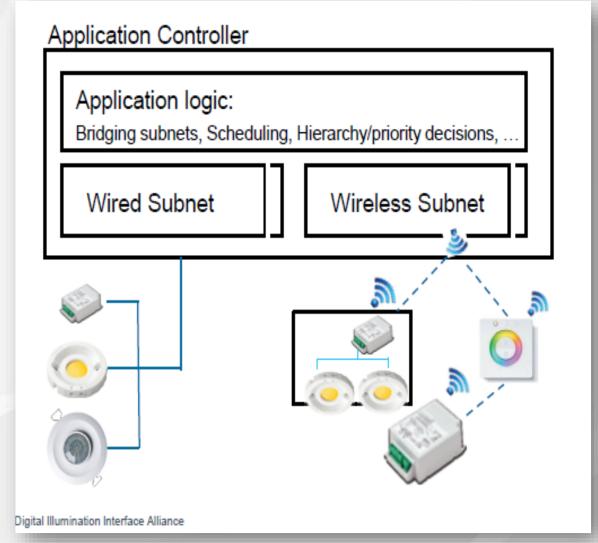




DALI Digital Lighting Control Advantages



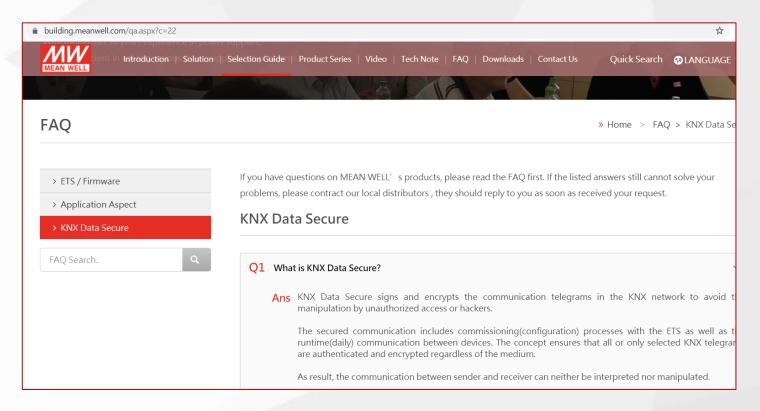
- It is easy to expand and can be combined with any DALI 2.0 peripheral products, fully using Multi-Master's digital lighting control.
- DALI can modify the group settings at any time, no need to re-wiring, reducing construction costs and time.
- DALI can be combined with wireless IoT
 (Bluetooth/ Zigbee / Thread) or wiring KNX application and so on. Easy to integrate with other systems into a complete Ecosystem,



KNX Resource: Mini-Website and Short Form



- http://building.meanwell.com
- English, Chinese, German, Russian
- Provide FAQ (including KNX Data Secure), videos, technology news, data (application database) download... etc.











Poultry Lighting Application

LED Driver - NPF-200

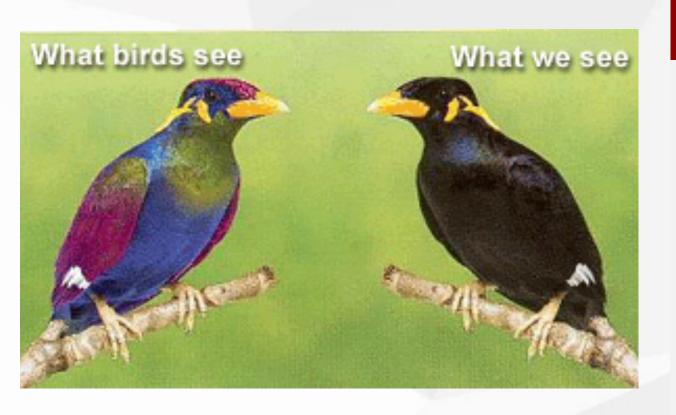
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Vision in Bird vs. Human

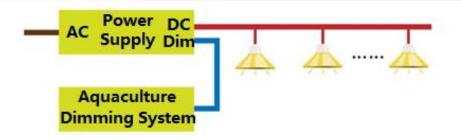


Sensitive vision

- ✓ Most birds have four types of cone cells: Red, Green, Blue and Ultraviolet.
- ✓ Bird is sensitive with light intensity and color.



Poultry Lighting Characteristics





Poultry Lighting Characteristics

- ✓ Intelligent control and management
- Customized spectrum to stimulate the growth of poultry
- ✓ Illumination intensity and time match the needs of day-age changes
- ✓ No stroboscopic requirements for dimming



Intelligent Control and Management

Brooding Period





Laying Period



Mature Broiler

Centralized Control



Flexible control of light time and illuminance, control the growth of chicks and special needs

Dimming and adding light control to improve the efficiency of laying eggs and reduce the defect rate

Dimming control, increase weight and feed efficiency

NPF-200 Features







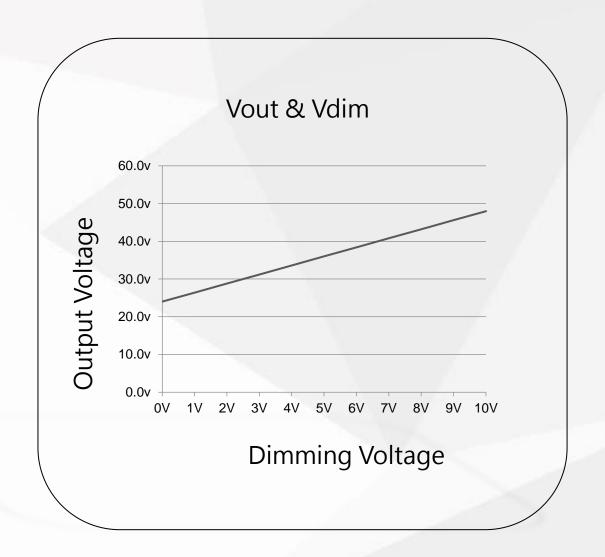
NPF-200 Features

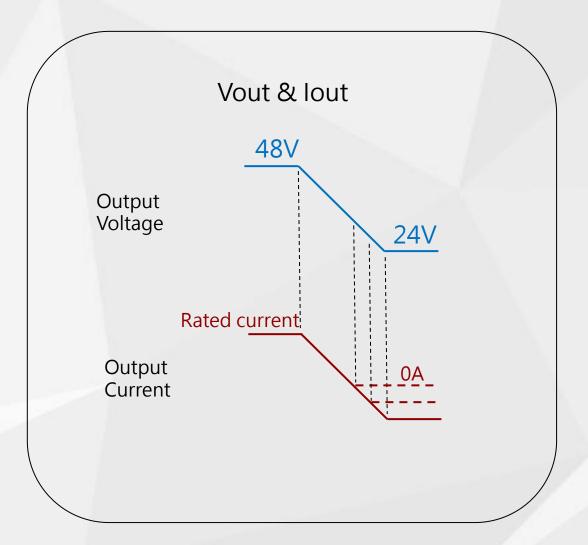
- ✓ Fully Potted, constant voltage + constant current design
- ✓ 3-in-1 dimming input interface (resistance/0~10V/10V PWM signal)
- ✓ Linear constant voltage dimming function, no flicker design, suitable for poultry lighting
- ✓ Comply with lighting safety regulations (EN61347 / UL8750)

For more than 200W requirements, please contact MEAN WELL/distribution channels



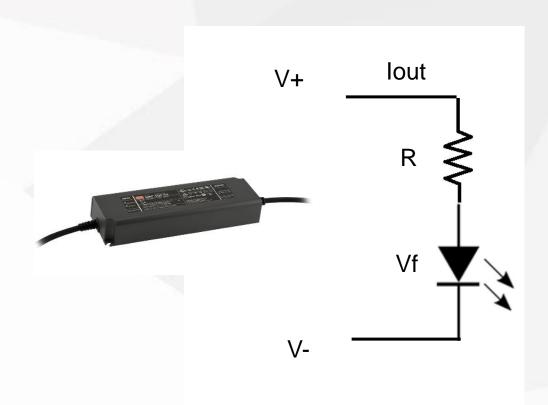






NPF-200 Linear Voltage Dimming





lout = (Vout - Vf) / R

Flicker Free

- ✓ R is a fixed value. Current ripple is determined by voltage ripple.
- ✓ Since voltage ripple is relatively low, it turns out the current ripple with a low level.

Linear Voltage Dimming Function Application





https://www.youtube.com/watch?v=Bjrc0zcGkuE&list=TLGGcX4IWr5XmCoxNDA0MjAyMQ



Poultry Lighting Key Factors

LED driver

- ✓ Waterproof with IP level.
- ✓ Stable and smooth change during dimming.
- ✓ Flicker free

System

- ✓ Light Color
- ✓ Light Intensity
- ✓ Illumination Time







DALI Control Application

DALI Controller / LED Driver

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DALI Interface Features



DALI Interface Features

- ✓ Data transmission via two-wire cable
- ✓ Each DALI bus controls 64 units/16 groups/16 scenes
- ✓ The control unit can be independently controlled
- ✓ The control distance is up to 300 meters (the actual distance depends on the wire diameter)
- Products without certification may have compatibilit issues

DALI-2 Specification Introduction





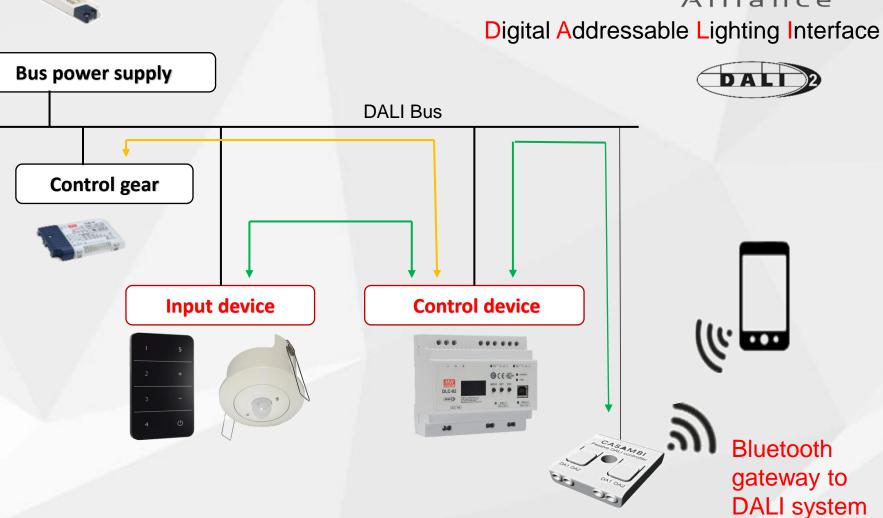


DALI Bus (IEC62386-101)

Control Gear (IEC62386-102/207/209)

Control Device (IEC62386-103)

Wireless system (IEC62386-104)



DALI version 1 vs DALI-2



What is DALI-2, difference with DALI1?



More rigorous transmission format

To improve the compatibility between products

New features

Example : Extended Fade Time 0.1 sec → 16 min

Standardized control

Input device and control gear communication must go through the application controller

Mandatory certification requirements

DALI-2 products must be fully certified by DiiA

DALI-2 Product



LED Driver

- LCM-25/40/60-DA2
- PWM-60/90/120-DA2
- ELGC-300-ADA
- HBGC-300-ADA
- HVGC-1000-DA
- LDC-55-DA2

DALI System

- DLP-04L/04R (DALI PSU)
- DLC-02 (DALI-2 Controller)





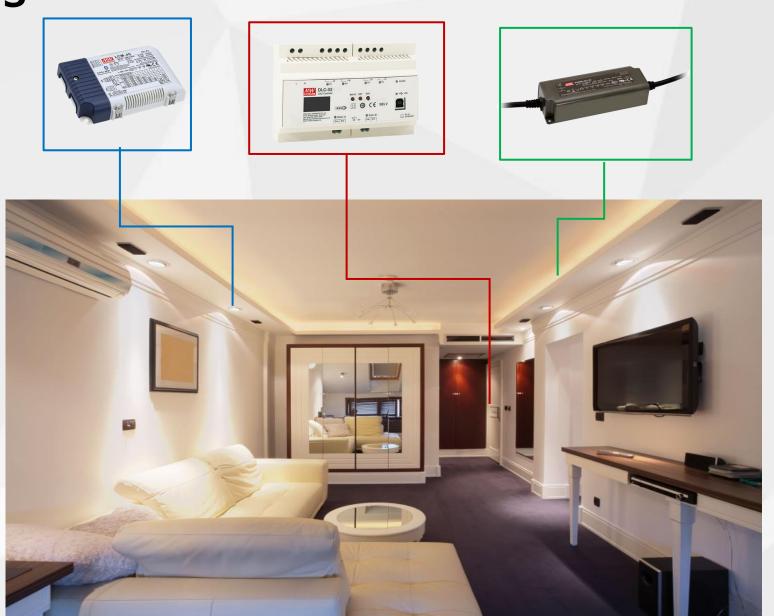


DLC-02 Features



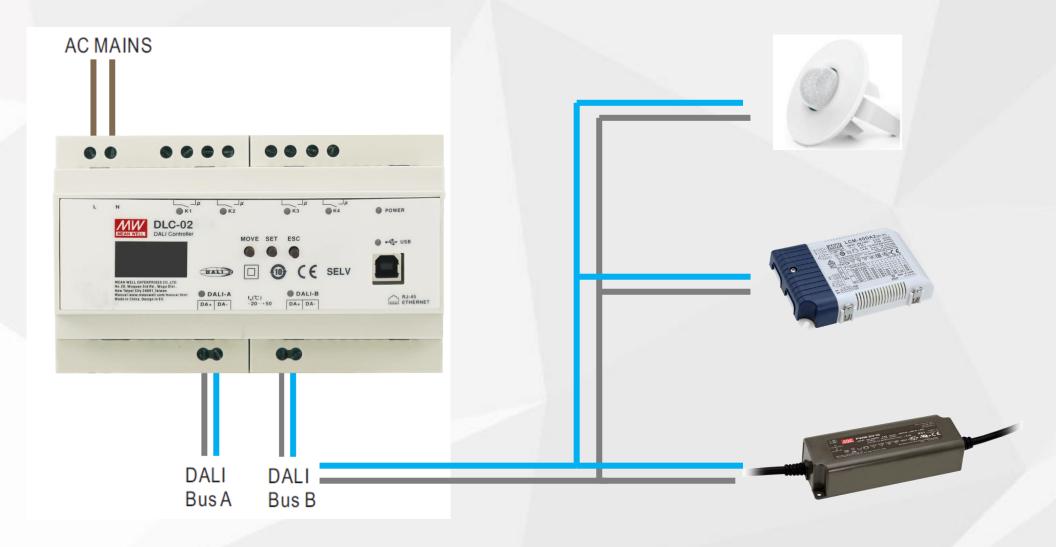
DLC-02/DLC-02-KN

- ✓ Compliant with DALI-2
- ✓ Dual independent DALI Bus output
- ✓ LCD display interface, built-in button control
- ✓ 2 x 64 control unit / 2 x 12 input control
- ✓ Built-in 4 sets of 250V/5A relays
- ✓ Support USB / Ethernet / KNX



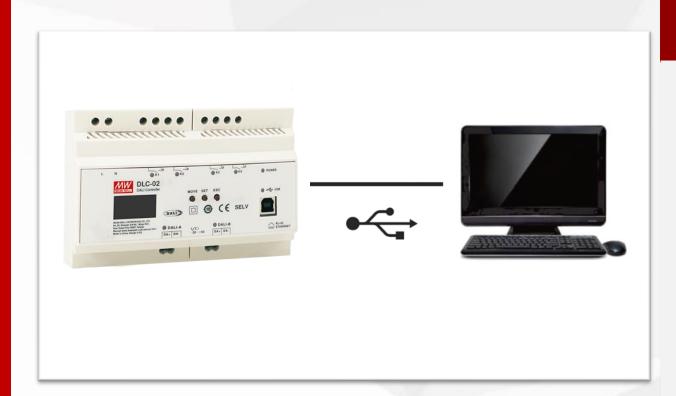
Wiring Diagram





USB Interface



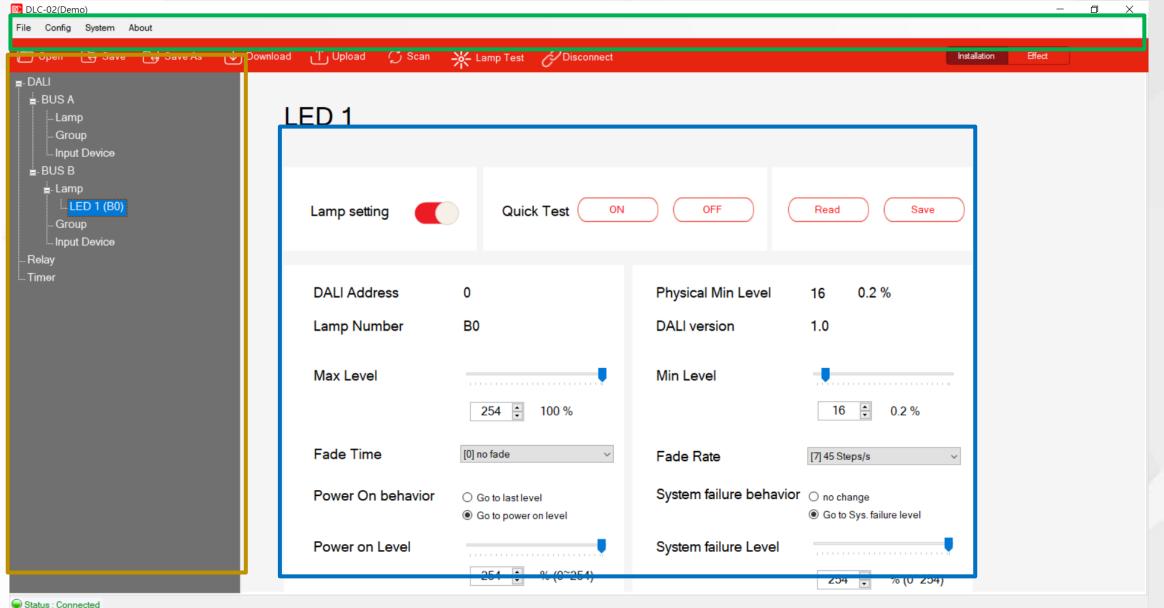


Software Settings

- ✓ DLC-02 PC Software remote monitoring and setting
- ✓ DALI command transmission, DALI bus device address allocation
- ✓ Timer setting
- ✓ Relay setting



DLC-02 Software Control Panel



Local Setting





Button Function

① MOVE: move the cursor

② SET: confirm options

3 ESC : return

Local Setting

- Display model and time
- ✓ Query information and the number of devices
- ✓ Broadcast/group/scene test
- Device replacement / short address setting
- Adjust Max. level / Min. level. / power on level
- △ KNX version cannot do local setting for DALI input unit

DLC-02 Webpage





Device Information

DALI

Installation

ReInstall Extension Install

Scan

Scan Online Devices

DALIA

Input Device(s): Lamp(s):

Online Lamps:

DALI B

Input Device(s):

Online Lamps:

Groups

Relay

K1: OFF K2: OFF K3: OFF

ON OFF

ON OFF ON OFF K4: OFF ON OFF

Fade Rate

Scene 1 0 0.0%

Scene 5 0 0.0%

Scene 7 0 0.0%

Scene 9 0 0.0%

Scene11 0 0.0%

Scene13 0 0.0%

Scene15 0 0.0%

☐ Group 1 ☐ Group 2 ☐ Group 3 ☐ Group 4

☐ Group 5 ☐ Group 6 ☐ Group 7 ☐ Group 8

☐ Group 9 ☐ Group10 ☐ Group11 ☐ Group12 ☐ Group13 ☐ Group14 ☐ Group15 ☐ Group16

Device Config Device G03: Read Configuration | Write Configuration G05: Device Type G06: Control gear failure G08: Lamp failure G10: G11: Physical Min Level **DALI Version** Max Level Min Level Power On Behavior Power On Level System Failure Behavior no change System Failure Level no change Fade Time no fade 🗸

> Scene 2 0 0.0% Scene 4 0 0.0%

Scene 6 0 0.0%

Scene 8 0 0.0%

Scene10 0 0.0%

Scene12 0 0.0%

Scene14 0 0.0%

Scene16 0 0.0%

Groups:

G01: G02: G03: G04: G05: G06: G07: G08: G09: G10: G11: G12: G13:

Device Control

Device Addr. □ALI A All ➤ Switch ON | Switch OFF

Device Control

Device Addr.

G14:

G15:

DALI B All 🗸 Switch ON Switch OFF

Group Control

GroupA_1 ✔ Switch ON Switch OFF

Scene Control

Device Addr. □ DALI A All ➤ Scene No. SceneA_1 V Command

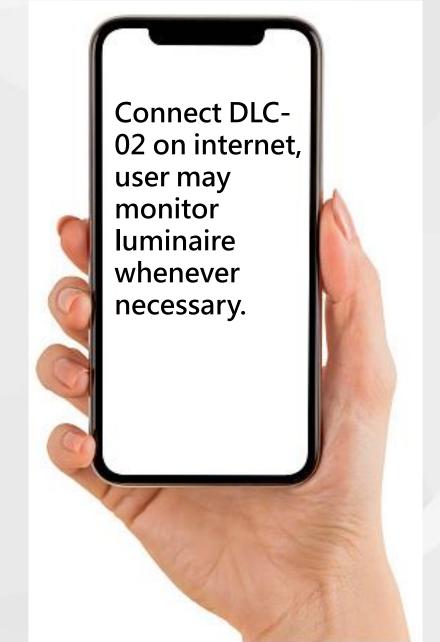
Device Addr. Scene No.

Group Control

GroupB_1 ▼ Group No. Switch ON Switch OFF

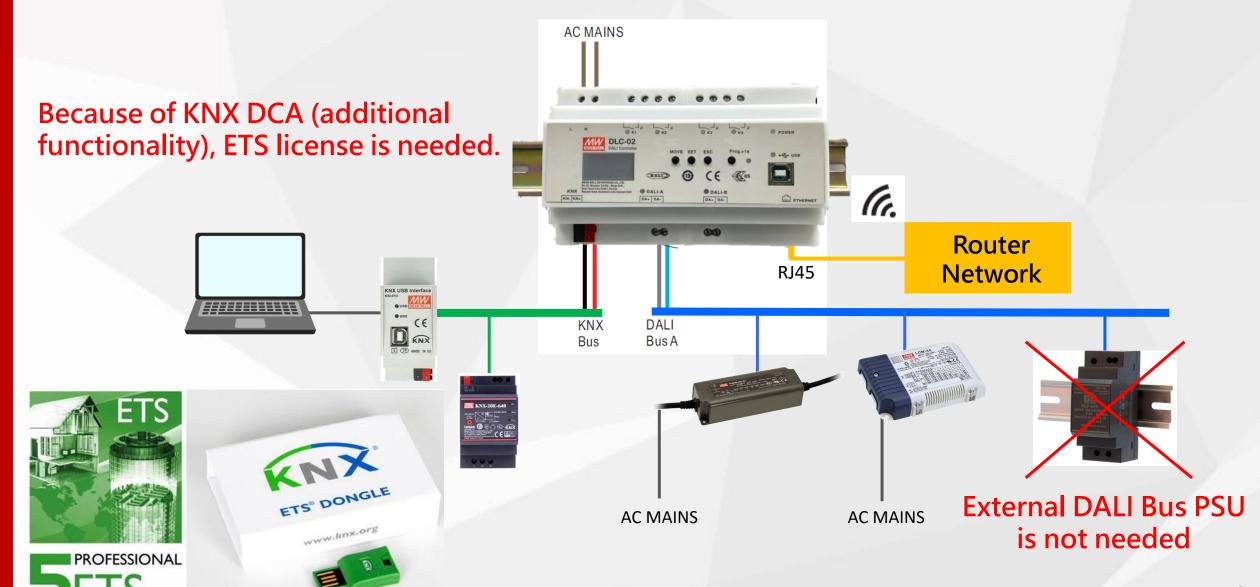
Scene Control

DALI B All 🗸 Command



DLC-02-KN Wiring Diagram





Difference between DLC-02-KN and DLC-02

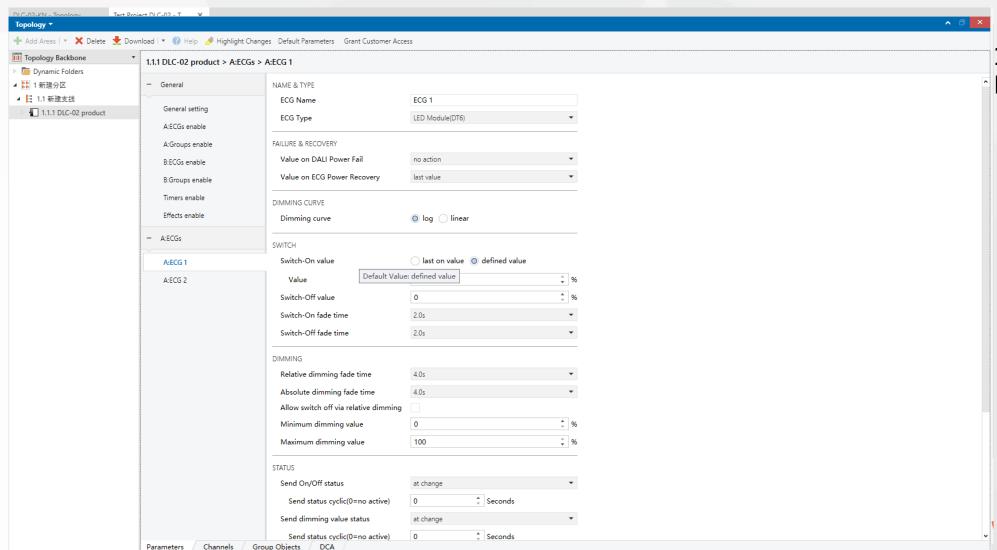


	DLC-02-KN	DLC-02
Controlled unit quantity	2 x 64 LED drivers*	2 x 64 LED drivers 2 x 12 input devices
Software	ETS5	MW software

^{*} Cannot enable DALI input control when using KNX communication

DLC-02-KN ETS5 Control Panel





1. Select Scan under DCA

2. Go back to Parameters page for each driver's parameterization.

DLC-02-KN Comparison



	KNX + KNX LED driver	KNX + DLC-02-KN + DALI Driver
System	Direct KNX connect/control	Gateway is needed for DALI drivers
Reliability	No impact for system if single unit failed.	If DLC-02-KN fails, whole lighting system will collapse.
Address	Each unit occupied one KNX address.	Max. 2x64 LED drivers can be controlled by one KNX address.
Distance	1000m (KNX)	300m (DALI)
Speed	9600 bps	1200 bps
Security	KNX Data Secure	No
Application	Residential building	Commercial building





Features and Application

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- PWM Application -



Residential lighting



Staircase Lighting

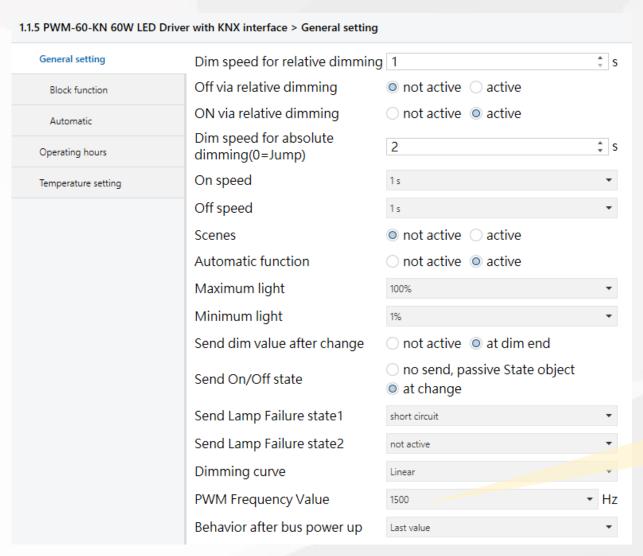


Commercial lighting



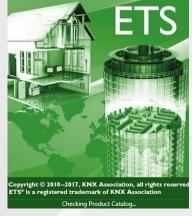
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- KNX Advantage -



- Smart
- Flexible
- One software (ETS)

200Hz - 4,000Hz





- KNX Advantage -





Driver's AC has to be plugged while addressing. Programmer might get shocked by touching high voltage output accidentally.



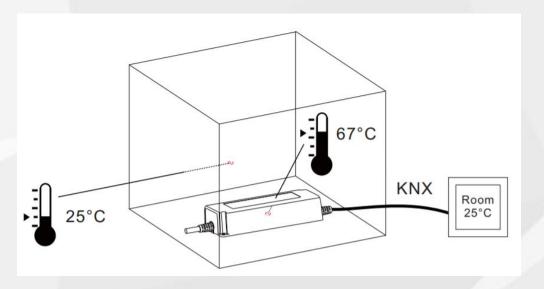


Connect KNX bus only. No need to plug Driver's AC while programming. Safe for programmer.



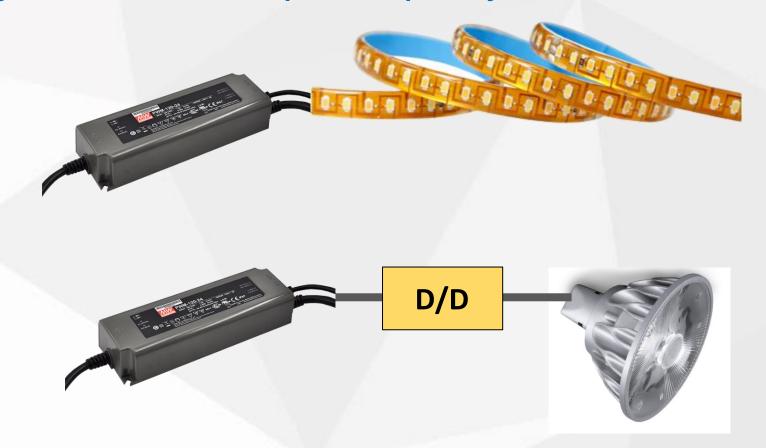
- PWM KN Functions -
- Basic functions: ON/OFF · Dimming control · Dimming speed · Scenes · Block function.
- Other functions: Staircase \ Constant light output(CLO) \ Dimming curve \ Operation time \
 Power consumption \ Short circuit report
- Special features: OTP setting by user \ 200 4KHz PWM output frequency.
- PWM-200KN New Features: Open circuit report · KNX Data Secure







- Adjustable PWM Output Frequency-



LED strips application: 200Hz - 4KHz

Not easy to be detected by human vision if driving on high frequency.

D/D application: 200Hz – 300Hz

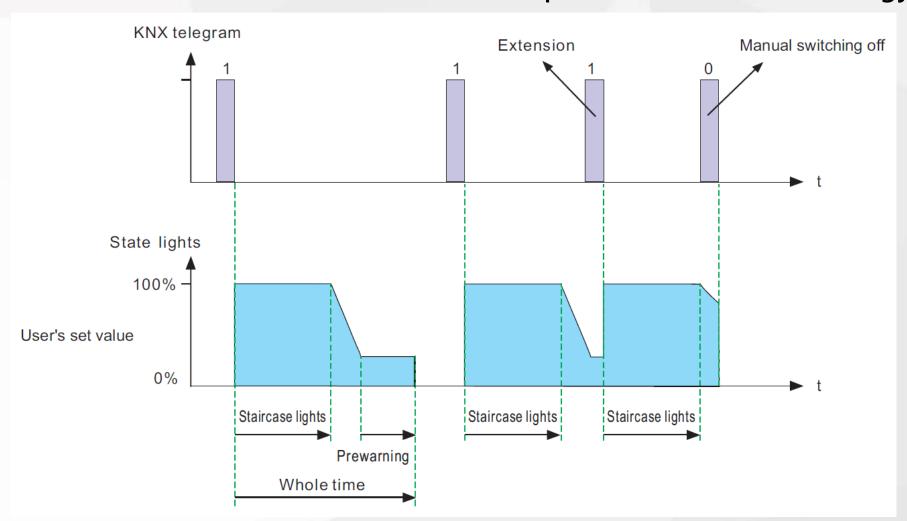
Over 300Hz , D/D might have audible noise issue or dimming issue.

Standard PWM, PWM-DA, PWN-BLE output frequency is fixed. Modification by request.



- Staircase Lighting-

With motion sensor, driver can control operation time to save energy.

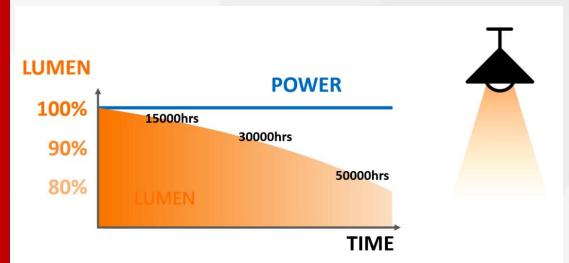






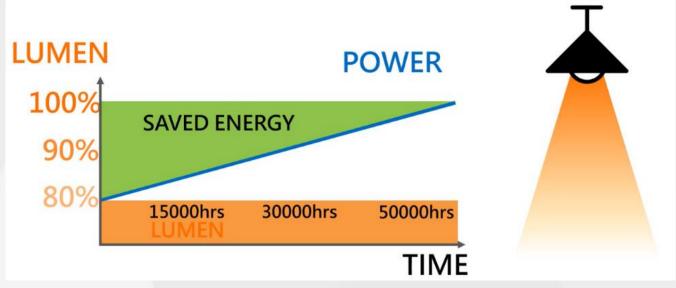
//// MEAN WELL

- CLO: Constant Light Output -



Without CLO: Luminous flux decreased from 100% to 80% after 50K hours operation.

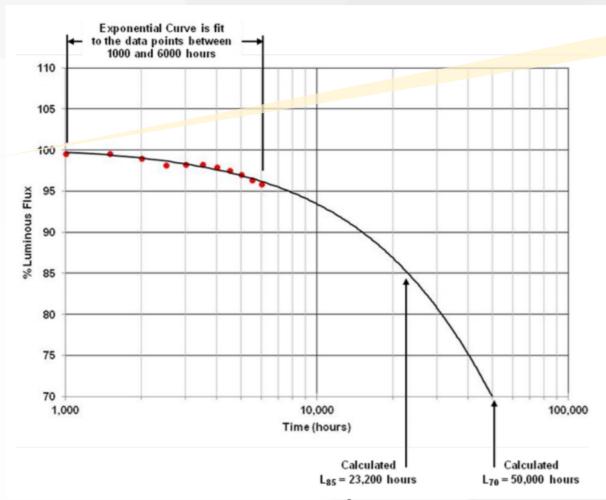
With CLO: Set luminous flux to 80% at the beginning. After 50K hours operation with expected LED attenuation, luminous flux keeps on the same level 80%.



General setting		LED mod
Block function		hours)
Scenes	Scheduled division 1	100
Scenes	Scheduled division 2	150
Automatic	Scheduled division 3	200
Operating hours	Scheduled division 4	300
Constant light output(CLO)	Scheduled division 5	

	LED module work time before(x100 hours)	CLO factor
Scheduled division 1	100	80%
Scheduled division 2	150	85%
Scheduled division 3	200 ‡	90%
Scheduled division 4	300 ‡	95%
Scheduled division 5		100%

- CLO: Constant Light Output-

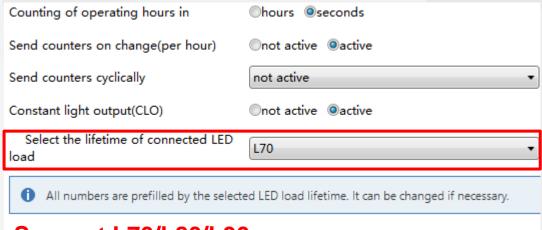


TM-21 curve of L70

Cree® XLamp® LED Long-Term Lumen Maintenance
https://cree-led.com/media/documents/XLamp_lumen_maintenance.pdf
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Red spots are LED actual measured result by LM-80

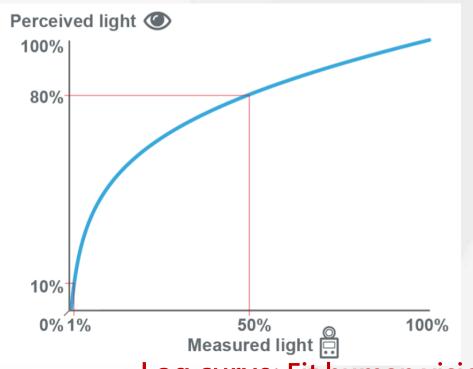


Support L70/L80/L90

	LED module work time before(x100 hours)	CLO factor
Scheduled division 1	100	70%
Scheduled division 2	200	74%
Scheduled division 3	400	80%
Scheduled division 4	500 🕯	92%
Scheduled division 5		100%

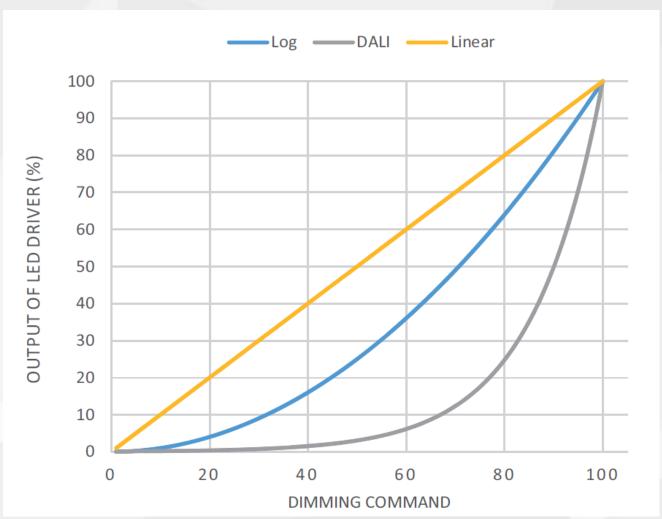


- Dimming Curve: Linear, Log -



Log curve: Fit human vision. Provide comfortable dimming experience.

Linear Dimming Curve Linear curve: Suitable for special lighting application (e.g. plant growing lighting)_{21 MEAN WELL All rights reserved}





- KNX Data Secure -







- KNX Data Secure Advantage -

■ Data integrity:

Ensure message completeness. To avoid message is tempered by external source for usurpation, each message is encrypted with authentication.

■ Freshness:

Only accept the latest message to avoid executing copy messages from hacker.

■ Confidentiality:

Encrypt by AES-128 CCM to reduce hacker attacking chance.



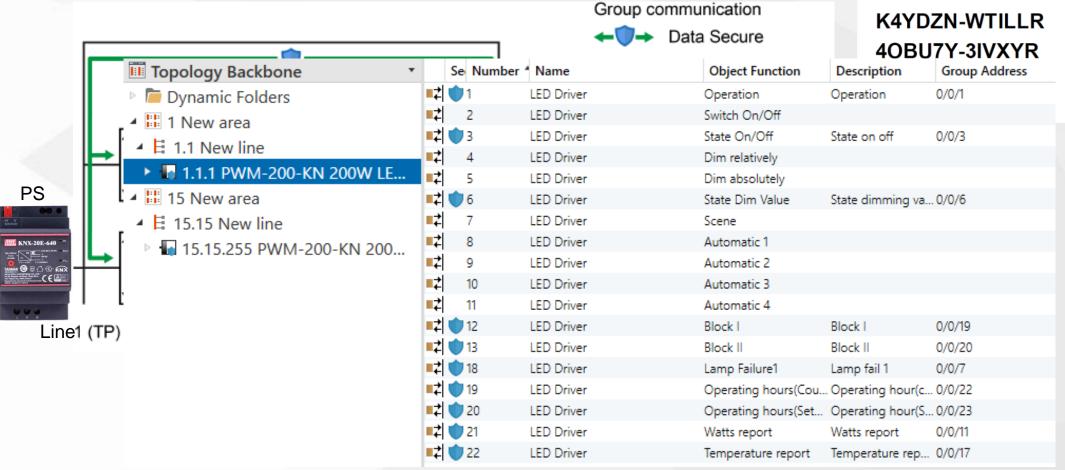


- How to use KNX Data Secure -

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AFROO4-HWZ3JO **K4YDZN-WTILLR** 4OBU7Y-3IVXYR

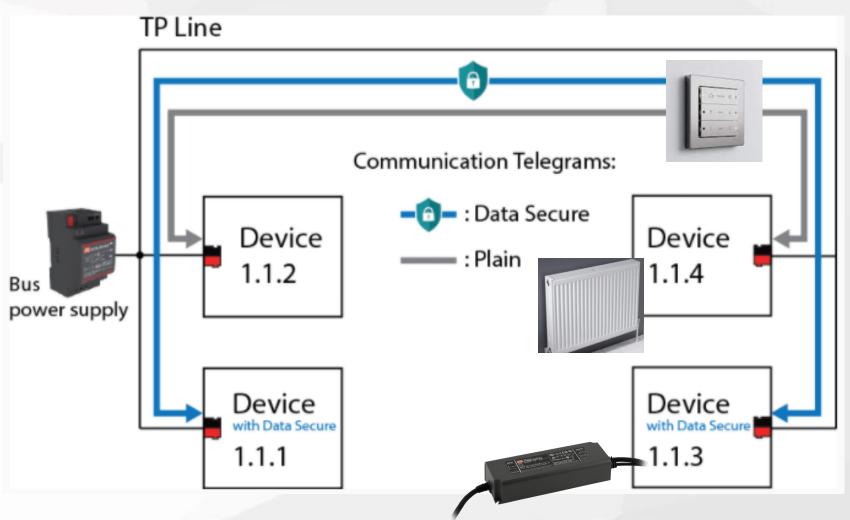






Can Data Secure be used with Plain (conventional) on the same Bus line?

Yes! Note Secure object cannot be linked with Plain object.



Set switch A/B to Secure: Can be linked with secure devices only.

Set switch C/D without Secure: Can be linked with all devices. If link to a secure devices, the secure function of that device has to be turned off.





Features and Application

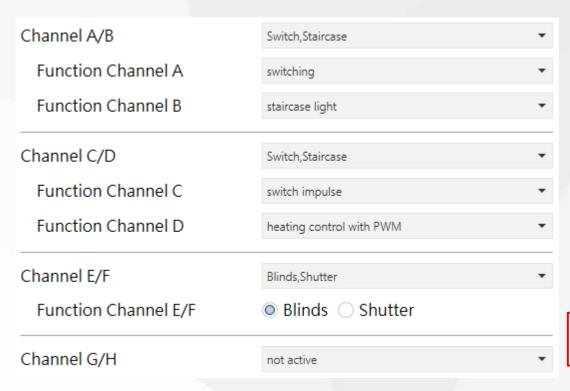
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KAA-8R Features





- Switch: Household application
- Staircase: Staircase/Basement lighting.
- Switch Impulse: Energy saving (Heater/Lighting)
- Heating control with PWM
- Blinds, Shutter









KAA-8R Blinds/Shutter Application



- Blinds -

Time for Up/Down movement	o same different	
Movement time	45	* S
Extension of movement time	5%	•
Step time for slats adjustment	200	‡ ms
Slat adjustment time	1200	‡ ms
Pause on reverse	500	‡ ms
Switch-On delay motor	200	‡ ms

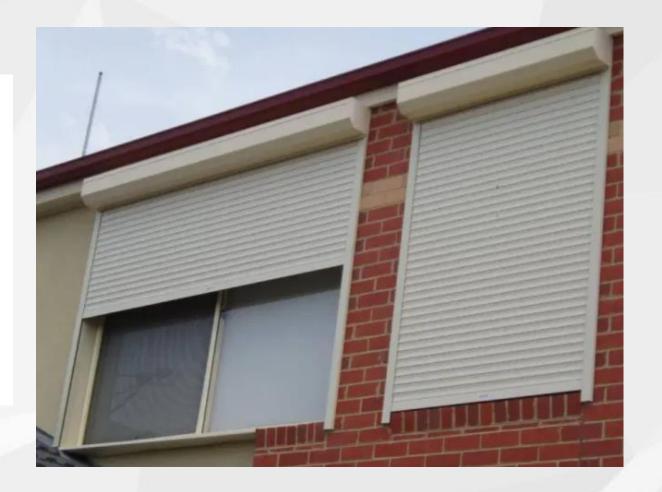


KAA-8R Blinds/Shutter Application



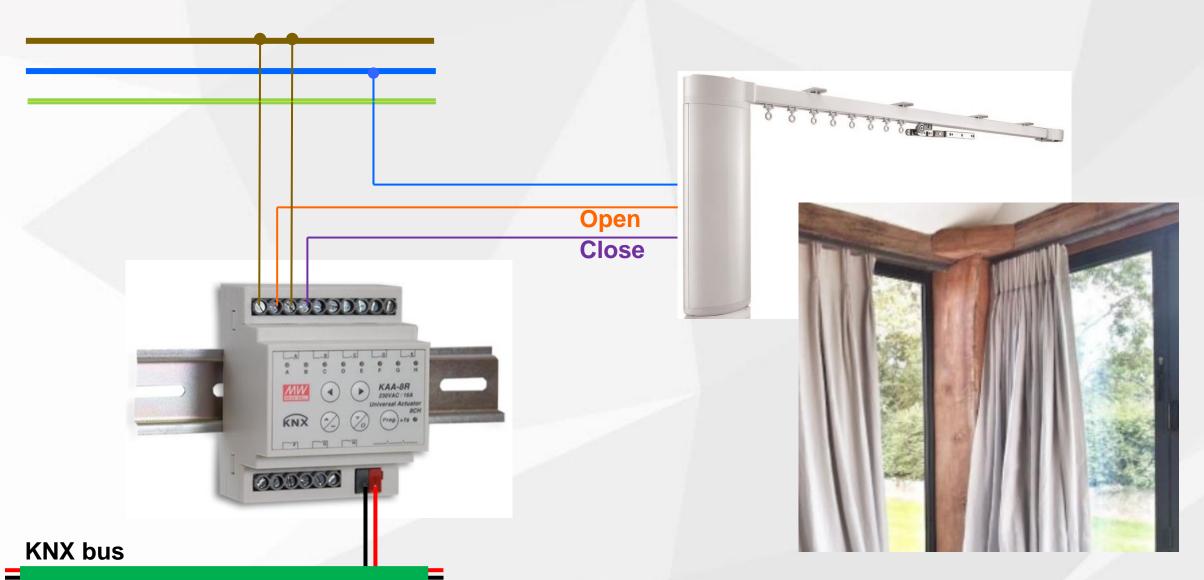
- Shutter -

Time for Up/Down movement	o same different	
Movement time	45	‡ S
Extension of movement time	5%	•
Short term operation	onot active active	
Movement time for short term operation	200	‡ ms
Up/Down movement can stop (Single object control)	o not active active	
Pause on reverse	500	‡ ms
Switch-On delay motor	200	‡ ms
Switch-Off delay motor	200	‡ ms



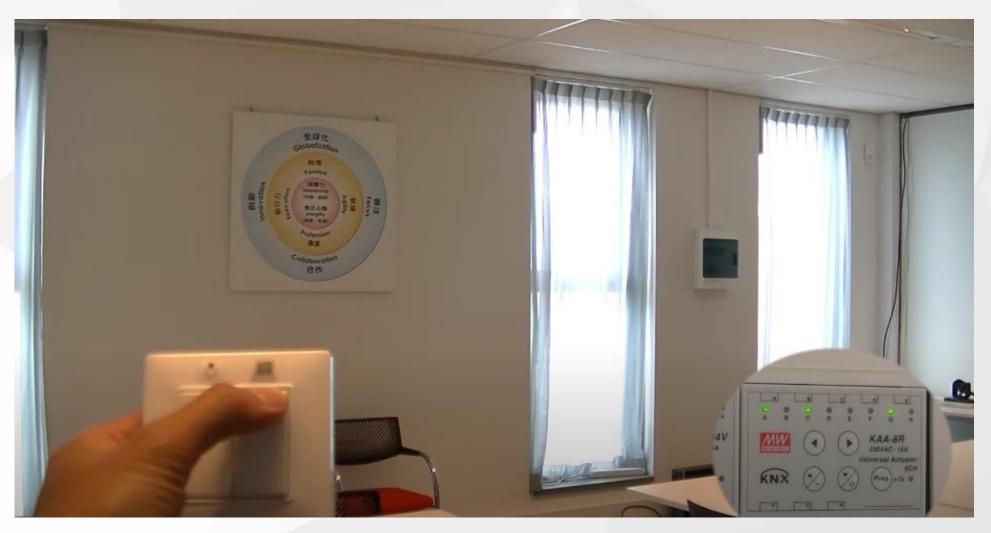
KAA-8R Typical Configuration





KAA-8R Demonstration





https://www.youtube.com/watch?v=x7E6lde28mY



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