S Series Intelligent LED Driver

0.1% Deep Dimming
Tunable White
Human Centric Lighting

Flicker Free
Meet:
CEC title 24 JA8 & JA10
IEEE PAR 1789-2015

50W S Series-Dual Channels LED Driver- MU050S150BQI601

MOONS' 50W S Series Dual Channels LED Drivers are designed for Human Centric Lighting and Tunable White application, mixed two channels achieve smoothest color temperature tuning and brightness dimming due to 0.1% deep dimming character, which let human feel like sunlight and moonlight. Fit with various application thanks to driver's various function, such as programmable parameters, different outline, optional dimming strategy, etc.

Main Characteristics

- Dual Channels, constant current driver
- Programmable operation window
- 0.1% Dimming & 65536 Dimming Steps
- Standby power<0.5W
- Integrated 12Vdc/100mA auxiliary power supply
- isolated DMX/RDM control
- 3 in 1: Tunable White(1500-6500K), solo dimming, dual dimming
- 50W Max each channel with total 50W load
- Flicker free for whole operation range

Benefits

- Application-oriented operating window for maximum compatibility
- Independent two channels for Tunable White application
- Ready for Zhaga book 18/low voltage power
- Common anode design for higher output current

Applications

- Office, Architecture, Education, Healthcare, Smart home

■ Compliance and Certification

- Comply with DMX/RDM protocol
  - i. E1.11 - 2004, USITT DMX512-A
  - ii. ANSI E1.37-1-2012 BSR E1.20-20xx, Entertainment Technology-RDM-Remote Device Management over DMX512 Networks
  - iii. BSR E1.20-20xx, Entertainment Technology-RDM-Remote Device Management over DMX512 Networks
- Comply with UL Class2
- UL, CE, ENEC, EAC safety approval

■ Electrical Specifications

Input	Efficiency (230Vac)	87% (Typical)
	Efficiency (100Vac)	86.5% (Typical)
	Voltage Range (Vac)	90~305
	Rated Input Voltage (Vac)	100~277
	Frequency Range (Hz)	50/60
	Power Factor	>0.9 @ 100~277Vac 50/60Hz input, with 50%~100% load conditions
	THD	<20% @ 100~277Vac 50/60Hz input, with 50%~100% load conditions
	AC Current (Typical)	0.7A Max @ 100Vac, 0.3A Max @ 230Vac
	Inrush Current (Typical)	<10A @ 100~277Vac input, 25℃ cold start and 100% load conditions
	Input Power (W)	66 (Max)
	Standby Power (W)	<0.5W @ 100V/60Hz, 230V/50Hz, 277V/60Hz
	Leakage Current (Max)	0.75mA Max @ 277Vac 60Hz input
Output	Output Voltage Range (V)	8~55
	Output Current Range (mA)	200~1500
	Rated Power (W)	50 (Max)
	Output Channel Number	2 or 1
	Ripple Current (PK-PK)/AV	20% Max @ output 300~1500mA conditions
	Current Tolerance	±5% @ setting current 200~1500mA
	Line Regulation	±1%
	Load Regulation	±3%
	Startup Time	<0.5S @ 100V/230V/277V
Auxiliary Output	Output Voltage	12Vdc (±5%) @ operation range
	Operation Range	0~100mA
Dimming Port	Control Protocol	DMX/RDM
	DMX Dimming	Isolated DMX dimming 0.1%~100%, optional dimming curve: gamma(default), logarithmic, linear, square
Protection	Open Circuit Protection (V)	58.5
	Short Circuit	Automatic recovery
	Over Temperature	Automatic recovery
Environment	Operating Temperature	-25~60℃
	Operating Humidity	20~95%RH, non-condensing
	Storage Temperature	-40~85℃
	Storage Humidity	10~95%RH
	Vibration	10/500Hz, 5G 12min/cycle, period for 72min each along X、Y、X axis
	Ingress Protection Rating	IP20
Safety & EMC	Safety Standard	UL8750, UL1310 Class 2, CAN/CSA-C22.2NO.107.1-01, EN61347-1, EN61347-2-13
	EMC Emission	FCC Part 15 ClassB, EN55015, EN61000-3-2 ClassC, EN61000-3-3
	EMC Immunity	EN61000-4-2,3,4,5,6,8,11, EN61547 (Surge L, N-FG: 2.5KV, L-N: 2.5KV)
Others	Lifetime	>50000 hours @ Tc=70℃ and 100% load conditions
	MTBF	500,000 hours, measured at full load, 25℃ ambient temperature SR-332 Issue 3
	Dimension (L x W x H mm)	408 x 30 x 21
	Weight	420g

Connector Layout

AUX±

i. The AUX circuit is isolated from primary (input) circuit and dimming circuit, but not isolated from secondary (output) circuit.

DMX±

i. The dimming circuit is isolated from primary (input) circuit and secondary (output) circuit .
ii. DMX Tunable White: address X is in charge of intensity changing, Address X+1 is in charge of color temperature changing.
DMX Dual: use two addresses to control two channels respectively.
DMX Solo: use one Address to control two channels simultaneously.
iii. Update firmware through DMX interface
iii. Maximum communication cable length

Material	Area mm²	AWG	Maximum cable length (meter)		
			25℃	50℃	75℃
Copper	0.5	20	112	102	93
	0.75	18	168	153	140
	1	17	224	204	187
	1.5	/	300	300	281

iv. Standby power <0.5W only if set dim level 0 and disable AUX

MCS±

i. MCS+/− interface voltage 5V
ii. Could connect to external NTC
NTC thermal management protects LED lamp, when the temperature of LED lamp over temperature protection point, the current will be reduced by 50% every 5 minutes. Default setting is 85℃.

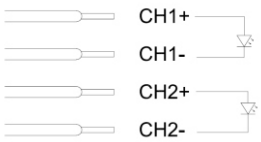
NTC compatibility list:

NTC Manufacturer	NTC Model NO.
MURATA	NCP21WB473J03RA
VISHAY	NTCS0805e4473JXT
VISHAY	NTCLE100E3473

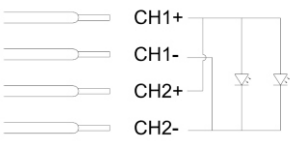
iii. The MCS terminal is to be used for factory programming and update of firmware program.
Not for connecting to a control device to perform control function (except NTC thermistor).

CH1±, CH2±

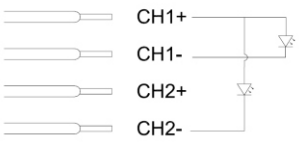
i. General connection



ii. Get larger output current through parallel connection



iii. Support common anode connection



ii. Maximum LED wiring length (copper)

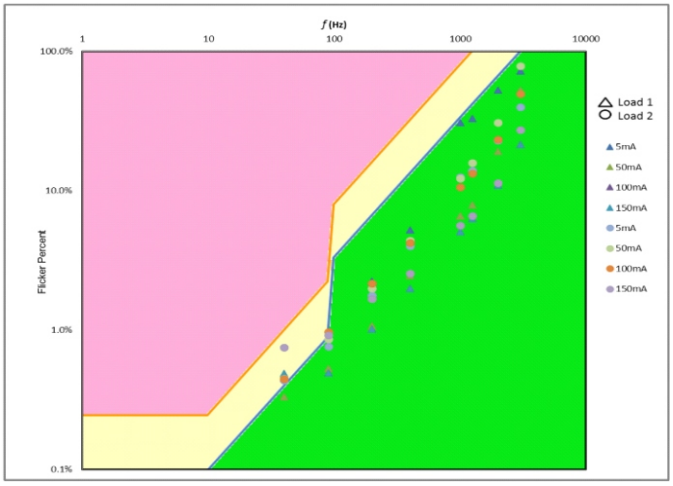
Wire Value	AWG 20 (0.52 mm²)	AWG 19 (0.57 mm²)	AWG 18 (0.81 mm²)	AWG 17 (1.03 mm²)	AWG 16 (1.32 mm²)
Distance (m)	16	18	25	32	41

! Please observe voltage drop over cable lengths.
! Longer cable lengths increase EMI.

Dimming Performance

Flicker Free

i. Meet: CEC title 24 JA8 & JA10, IEEE PAR 1789-2015
ii. The product utilize driver and LED load 1 and 2 is compliant with CEC title 24 JA8 and IEEE PAR 1789-2015 Recommended Practice 1 in the dimming range from 5mA to 150mA.



Dimming Method

In the range of 200~1500mA, the current operates in continuous mode;
In the range of 0~200mA, the current operates in PWM dimming mode, and the PWM frequency 3.6KHZ.

Porgrammable Performance

Touch Setting

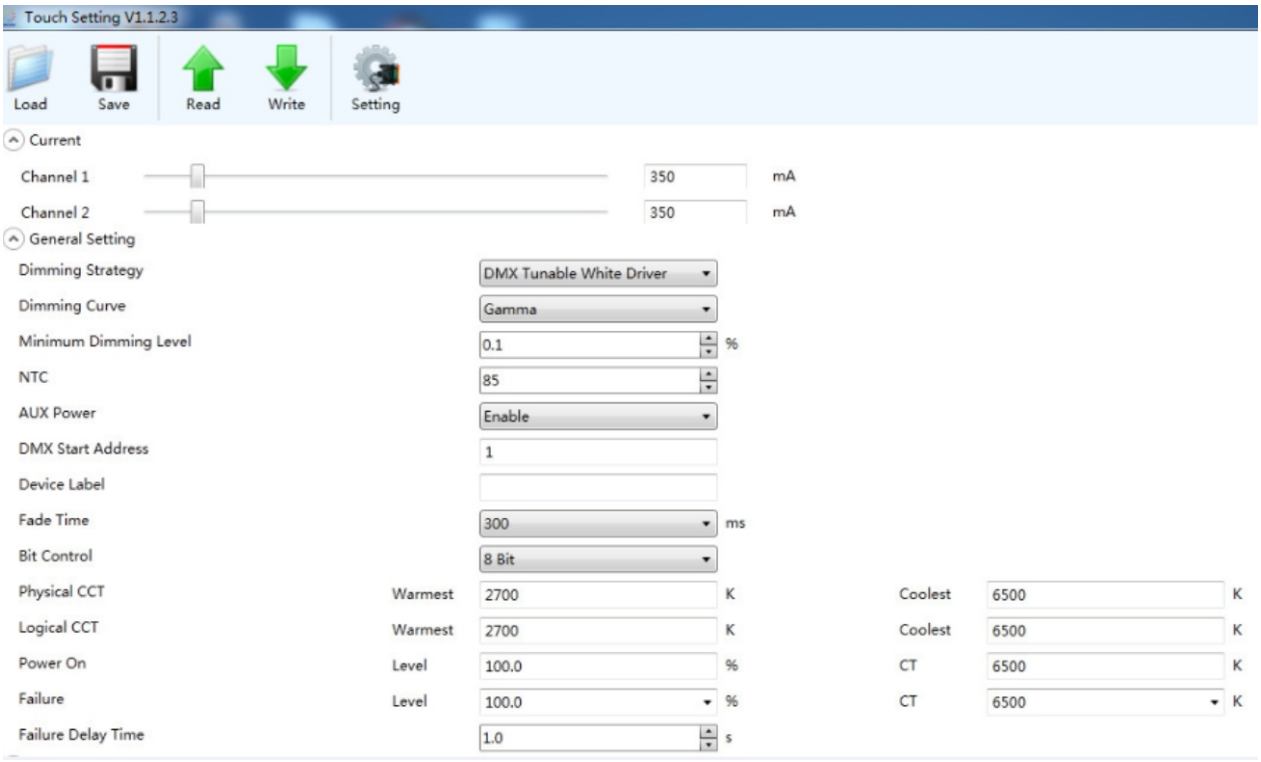
Program driver's parameters without cable. Download Software

Smartkey Network

Program driver's parameters through cable programming. Update driver's firmware. Download Software

1mA Current Programmable Step

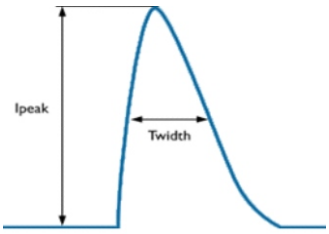
Default Factory Setting



Inrush Current

Ipeak & Time

Input Voltage	Inrush Current Ipeak	Inrush Current Time, measured 50% of Ipeak
100VAC	3.5A	35us
220VAC	8A	35us
277VAC	9A	40us

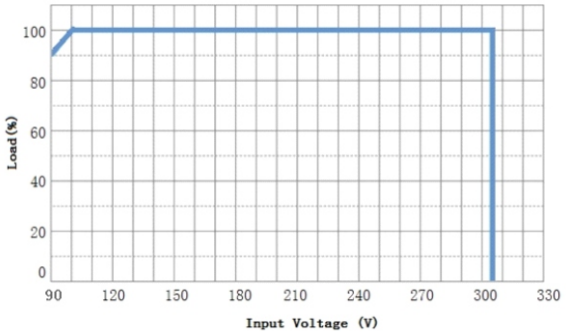


Automaitc Circuit Breakers

ACB Type	B10	B13	B16	B20	C10	C13	C16	C20
Number of LED Drivers @rated load	15	19	24	30	20	26	32	40

■ Curve

■ Derating Curve



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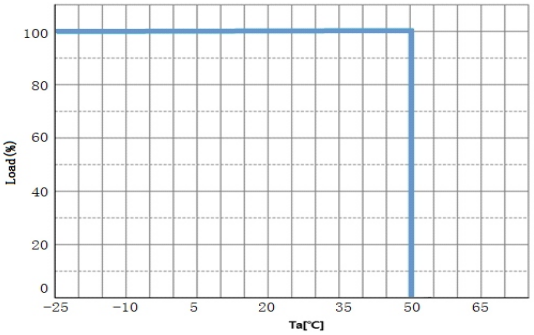
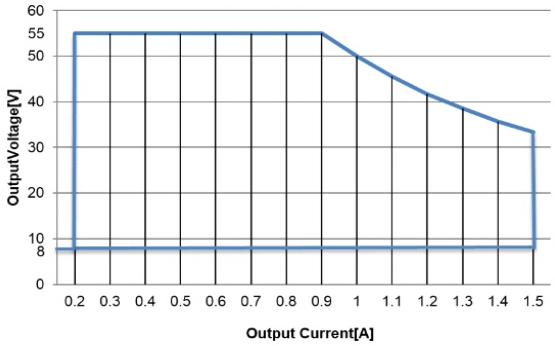
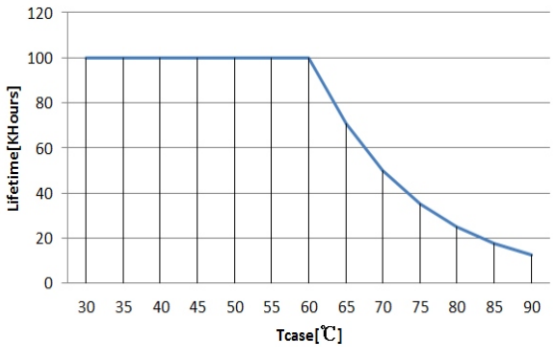


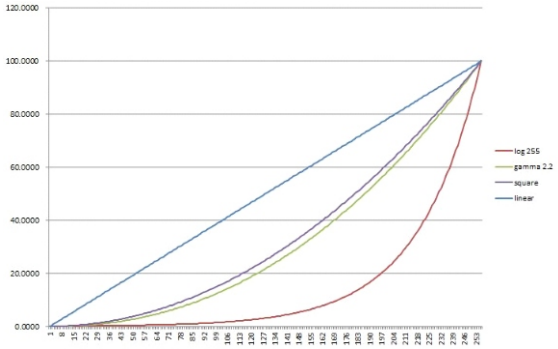
■ V/I Curve



■ Lifetime Vs Tc

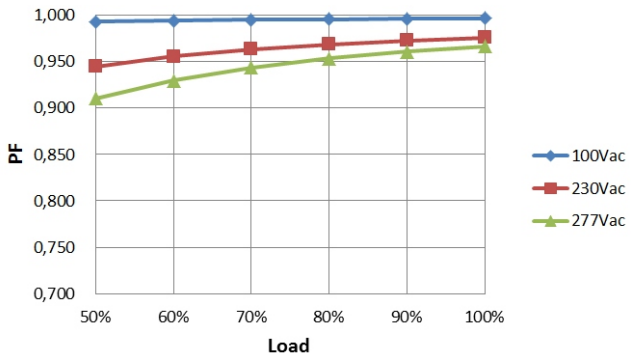


■ Dimming Curve

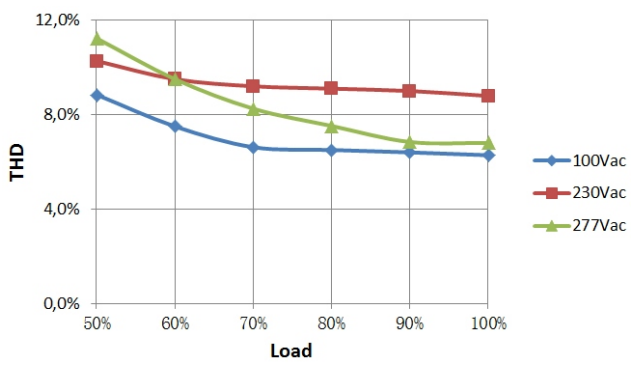


■ Curve

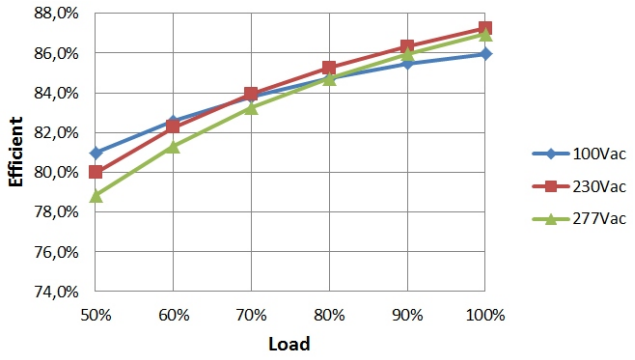
■ PF VS Load Curve



■ THD VS Load Curve

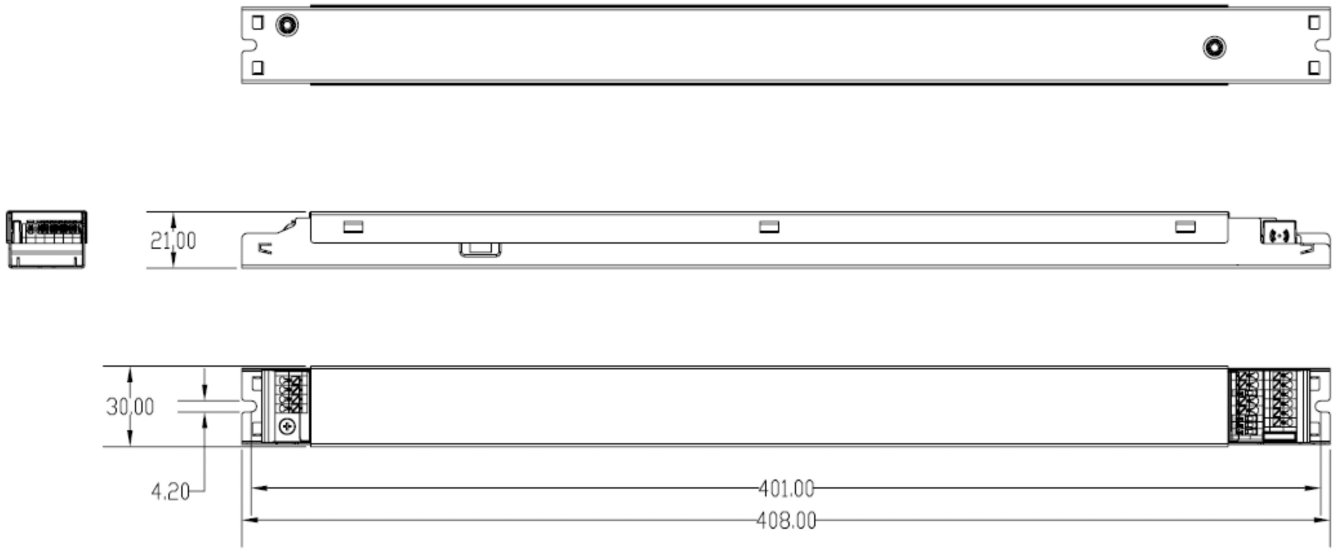


■ Efficiency VS Load Curve

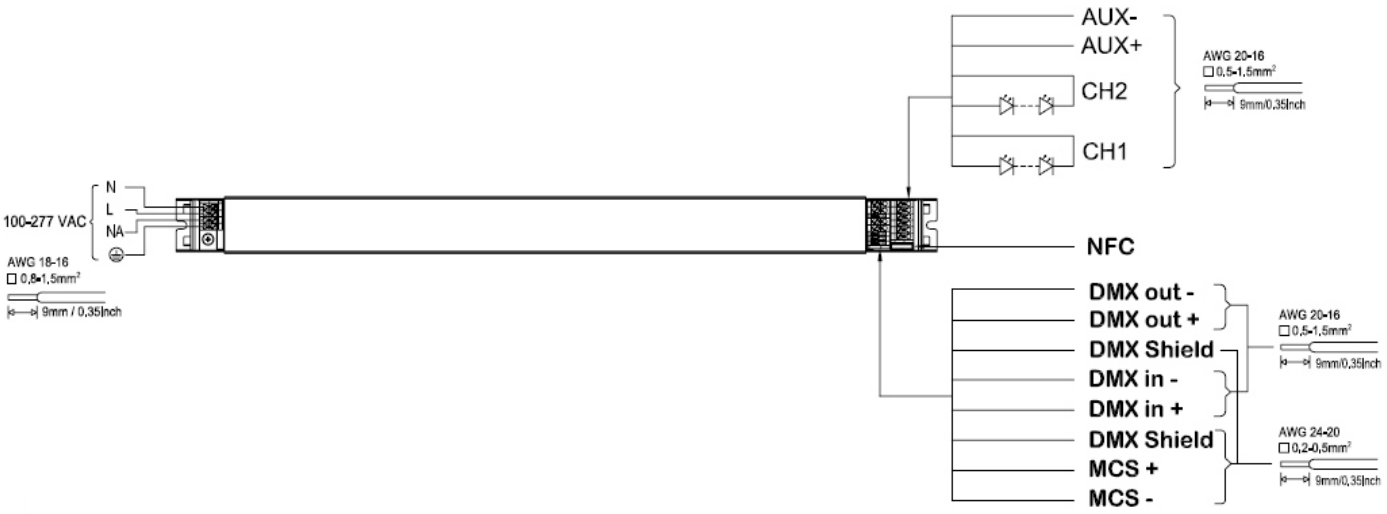


Mechanical Specification

Dimensions (Unit: mm)



Ports

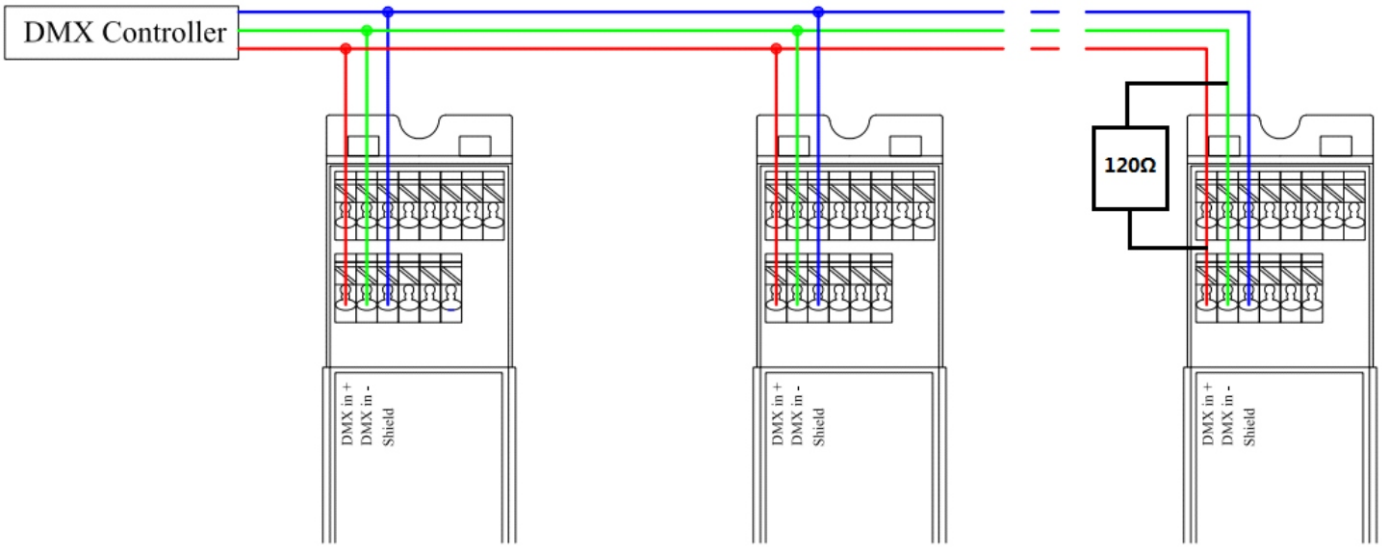


!These terminals are intended for both soild and stranded wire.

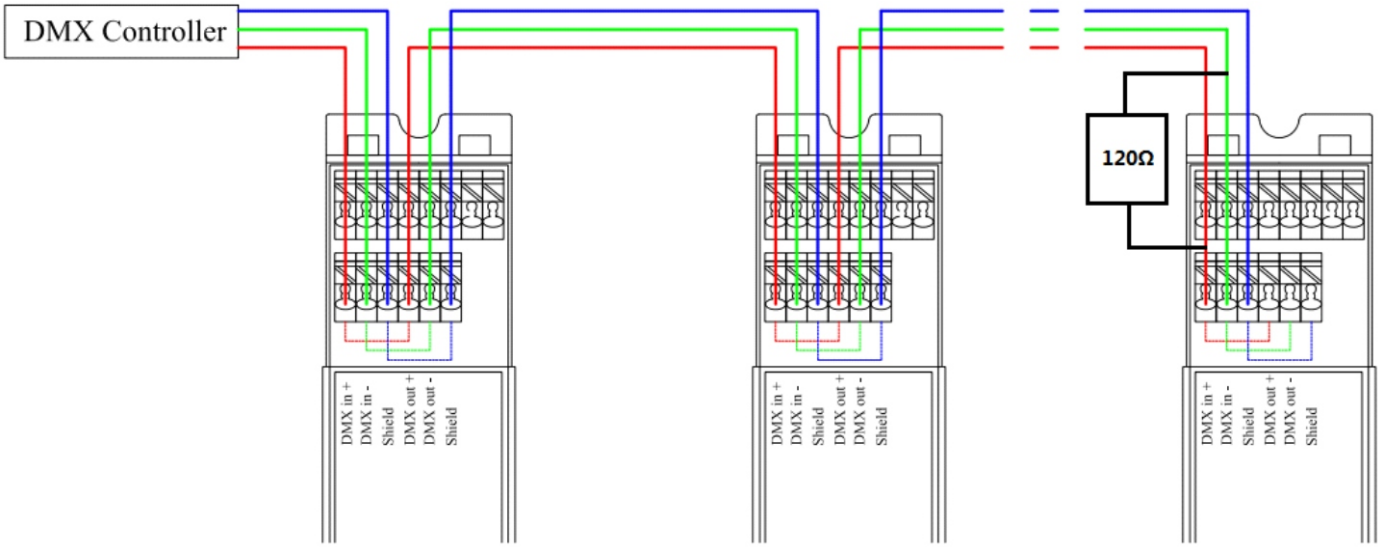
!To remove wire, insert screwdriver into slot.

Connecting DMX/RDM lighting systems

- Connecting the cable on MOONS' drivers with 'DMX IN' terminals only.
  Drivers with only one set of DMX terminals(DMX IN +, DMX IN -, and DMX shield)use a standard DMX bus topology (daisy chain).
  At the last driver, a 120Ω resistor must be connected between the DMX IN + and DMX IN - pins of the driver as termination.
  This method is compatible with RDM.



- Connecting the cable on MOONS' drivers with 'DMX IN' and 'DMX OUT' terminals.
  Some MOONS' drivers have an extra set of DMX terminals (DMX OUT +, DMX OUT - and DMX shield) in addition to the'DMX in' terminals to make installation easier. Internally, these 'DMX OUT' terminals are electrically connected to the 'DMX IN' terminals.
  These drivers also use standard DMX bus topology (daisy chain).
  At the last driver, a 120Ω resistor must be connected between the DMX IN + and DMX IN - pins of the driver as termination.
  The 'DMX OUT' connections are compatible with RDM.



! When 32 pcs drivers' signal wires are wired as Daisy chain topology with 'DMX in' and 'DMX out',
user can use MOONS' Smartkey and Smartkey Network Software to define first driver's address,
other drivers will be addressed according to drivers' order automatically.Please refer to SmartkeyNetwork_Software User Manual . Download Software

RoHS Compliance:
Our products comply with the European Directive 2011/65/EU, calling for the elimination of lead and other hazardous substances from electronic products.

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