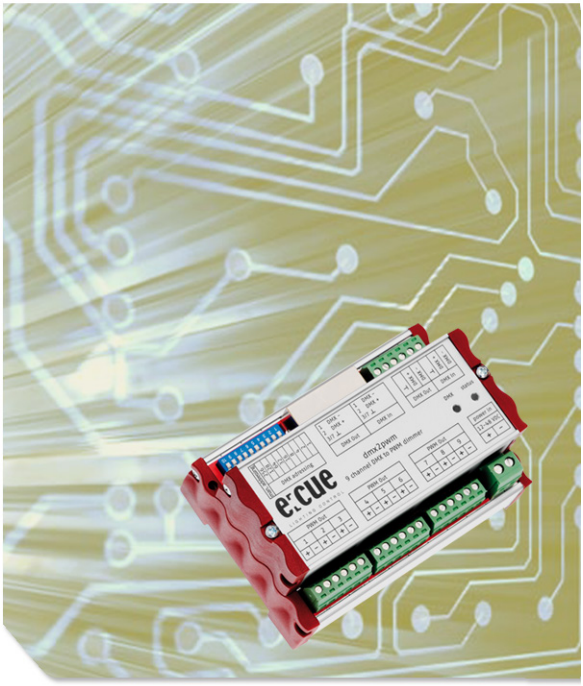
e:cue



DMX2PWM 9ch

Setup Manual

e:cue DMX2PWM 9ch Setup Manual (original issue)

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BU Digital
Karl-Schurz-Strasse 38
33100 Paderborn, Germany

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1 Safety instructions

Only use the device in compliance with the environmental conditions specified and watch the technical characteristics. Otherwise the unit may be damaged or malfunction will happen.

Only use original e:cue accessories to power the device Other power supplies can damage the unit.

To prevent the device from overheating, only operate it in well-ventilated environment. Ventilation may not be obstructed. Do not install next to heat emitting sources or in a place subject to direct sunlight. Overheating damages the device.

Device components inside the system can reach high temperatures! To avoid burns, allow the unit to cool for at least 20 minutes before unmount or repair.

Installation and maintenance of this product must be performed by individuals who are knowledgeable about the procedures, precautions and hazards associated with the product.

2 General installation guidelines

Do not route network, DMX or any other communication line together with power lines. Data traffic or functions can be disturbed.

We stongly recommend keeping the dI/dt*) loop as small as possible. Install the dimmers, PSUs, and LED modules as close together as possible.

The high dI/dt cables shall not be installed close to the DMX data cables.

For DMX and power, it is recommended to use shielded cables only and to connect the shield to earth.

*) dI/dt means high current pulses caused by PWM dimming. These pulses may interfere with the DMX signal.

3 Device description

The e:cue DMX2PWM PWM LED Dimmer is a 9 channel DIN rail mounted dimmer for use with constant voltage fixtures. The input voltage is variable from 12-48 V DC and each output channel has a maximum output current of 2 A. Every output channel can be individually controlled via DMX and the DMX output allows chaining of multiple devices.

The option to either manually or automatically address the dimmer to a DMX Channel provides a simple solution for small to complex control scenarios. The reverse supply protection and self-resetting overcurrent protection do help to avoid malfunction and damage caused by faulty connections. Two status LEDs show the status of the dimmer and the status of the incoming DMX signal. Screw terminals provide connectivity for power input, PWM output and the DMX signal input and output.

3.1 Key features

- For use with constant voltage fixtures
- Isolated DMX-out for chaining multiple dimmers
- Two user selectable DMX addressing modes: auto addressing or manual addressing
- Input voltage range: 12 ... 48 V DC
- Max. output current of 2 A per channel (overcurrent protected)
- Max. continuos input current: 14 A in 14 bit PWM resolution calculated from 8 bit DMX value
- Low side switching
- Reverse supply protection
- Overcurrent protection (self resetting)
- DIN rail housing

4 Delivery Content

DMX2PWM 9ch. dimmer

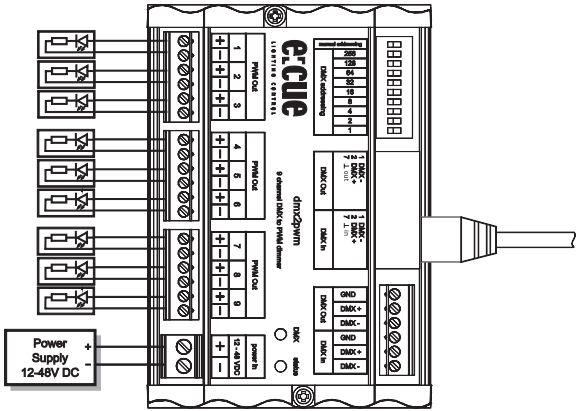
5 Hardware Installation

5.1 Interfaces & cabling

The PWM switching node is designed as a low-side switch and is able to handle a maximum current of 2 A. Each output channel is short circuit protected. As soon as an overcurrent or short circuit situation is detected, the switch of the corresponding channel will immediately shut down. The STATUS LED is blinking to signal the overcurrent error. The dimmer tests the output repeatedly if the overcurrent still exists. It will re-enable the output as soon as the overcurrent is removed.

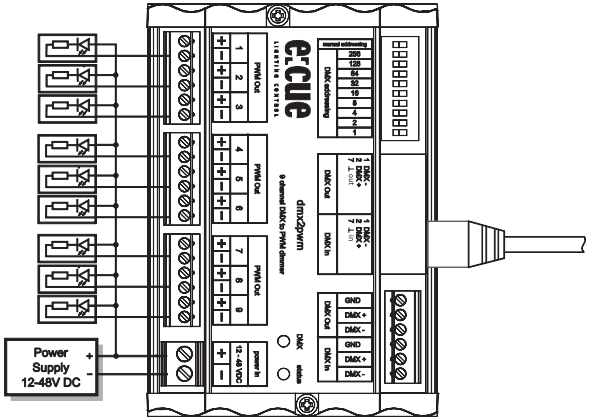
For the use of the DMX2PWM dimmer device a DC power supply is necessary. The choice of the power supply voltage only depends on the supply voltage of your LED fixtures, but must remain in the range from 12 V to 48 V DC. Please consider that the power supply must be able to provide the current for the connected LED fixtures and the DMX2PWM dimmer. Multiple LED fixtures where each one needs a different voltage level cannot be used with one dimmer device at the same time.

The (+) line of the Power supply connection (“power in”) is directly routed to the (+) connector of each PWM output. The following picture shows the basic connection scheme:



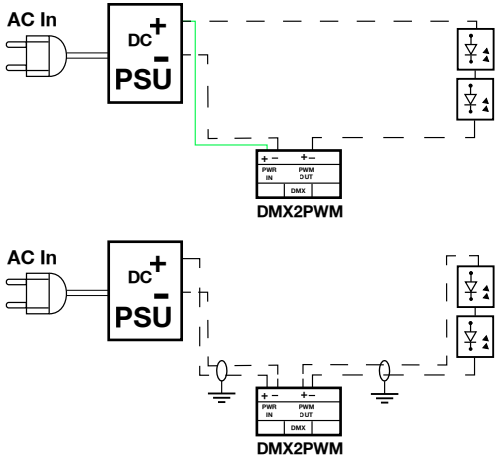
The advantage of the above shown type of connection is the reverse supply protection of all LED fixtures and the dimmer itself. Alternatively it is also possible to connect LED fixtures as shown in the following figure.

Alternative connection scheme:



Due to the PWM dimming concept, the current sourcing the LED modules is being switched on and off with a high frequency by the dimmer. The cables which carry the current pulses (dI/dt cables) shall be kept as a short as possible to not cause interferences or radiation. It is strongly recommended to keep data cables, such as DMX, away from the dashed marked cables shown in the picture below. The use of shielded cables is also recommended.

The following pictures shows the dl/dt cabling; the dashed lines as the high current loop (high dl/dt):



Always select the power supply output voltage accordingly to your LED fixture input voltage. Make sure that the power supply cables are specified to carry the complete amount of current needed by the connected LED fixtures. We rcommend to install the dimmers, PSUs, and LED modules as close together as possible. We recommend to not install the power cable close to the DMX data cable.

5.2 DMX

A DMX master must be attached to the DMX-In connector. If a valid DMX signal is detected by the DMX2PWM device, the green DMX LED is lit.

Use shielded cables only.

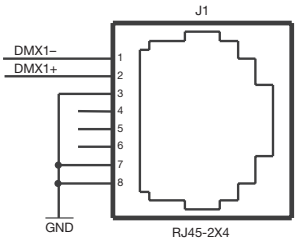
To connect multiple devices in a chain, connect the DMX-Out port of the first device to the DMX-In port of the next device. For details about setting up a DMX address, please refer to chapter 4.

The DMX-Out port is galvanically isolated from DMX-In and other parts of the dimmer. Please do not short circuit the GND connectors of DMX-Out and DMX-In. The isolated DMX-Out eliminates the risk of ground loops when using multiple dimmers is a chain.

The DMX2PWM 9-channel dimmer is equipped with two kinds of connectors for DMX. Depending on your installation you can either use the RJ45 connector or the screw terminals. The corresponding contacts of the RJ45 connector and screw terminals are shortened.

Do not connect DMX-In screw terminals and RJ-45 at the same time! We recommend to not install the DMX data cable close to the dI/dt cables.

DMX RJ45 connections



6 Device Setup

6.1 Manual address settings

Manual addressing mode is activated when switch 10 “Man. Addressing” is set to position “ON”. When manual addressing mode is activated, the user can set the device’s base address (address of PWM output channel 1) using the switches 1 ... 9. To derive the desired address, the corresponding values of the switches which are set “on” have to be added.

Example: Desired DMX address: 22: turn on switch2 (2), switch3 (4) and switch5 (16), all other switches must be left “off/open”. 16 + 4 + 2 = 22

If all address switches are set to “off” position, the device’s base address is automatically set to 1.

6.2 Auto addressing mode

To enable auto addressing mode, turn off switch 10. Auto addressing mode should be used when connecting several DMX2PWM dimmers in a chain. The first device in a chain occupies the DMX addresses 1..9. The next one, which is connected to the DMX-Out connector of the previous one, uses addresses 10 ...18 and so on.

If a base address is already set (see manual address setting), the device also uses this address in auto addressing mode as its base address.

Example 2:
The first device in the chain has been configured for base address 2 and the next device has the base address 4. The result is that the first device occupies the address 2 to 10 and the next device uses address 14 to 22.

To avoid confusion when using the auto addressing mode it is recommended to reset the base addresses of all devices to 1 or turn off all address switches.

7 Status LEDs

LED	Description
DMX off or flickering	No DMX signal recognized or not connected
DMX on	DMX present
STATUS off	Power supply not connected
STATUS on	Normal operation
STATUS blinking	Overcurrent detected on one or more channels

8 Technical data

Dimensions mm/inch (WxHxD)	107 x 76 x 59 mm / 4.21 x 2.99 x 2.32 inch
Weight	0,228 kg/0.5 lb.
Power	12 ... 48 V DC (screw term.)
Operating Temperature	0°... 50° C/32°... 122° F
Storage Temperature	-20° ... 80° C/-4° ... 176° F
Operating/Storage Hum.	0 ... 80%, not condensing
Protection class	IP20
Housing	Aluminium, Plastic
Certifications	CE, ETL, UKCA
Inputs	DMX512 (RJ-45 or screw terminals)
Outputs	Isolated DMX512 (RJ-45 or screw terminals) for chaining multiple devices 9 output channels (screw terminals): + connector: identical to input voltage - connector: low side PWM switch
Device type	Lamp control gear
Supply voltage	12 ... -48 V DC (SELV equivalent) nominal, 5 .. 55 V DC absolute maximum supply input is reverse voltage protected
Power Consumption	0.8 W (idle, all channels off, DMX connected)
Output current per channel	2 A (Overcurrent protection, ±10%)
Max. input current at “power in”	14 A
Max. output load capacitance	1 µF
Overcurrent retry delay	1 sec.
Minimum on time	2.5 µs
PWM frequency	488 Hz
PWM resolution 8bit DMX value)	14 bit (optimized dimming curve calculated from
Data transmission	DMX512 and e:pix
Max. devices in one chain	32 (depends on cable length and quality)

Max. wire cross section	1.5 mm² (for PWM outputs) (max. 2.5 mm² for power supply)

9 Certifications

CE

C ETL LISTED US

Intertek

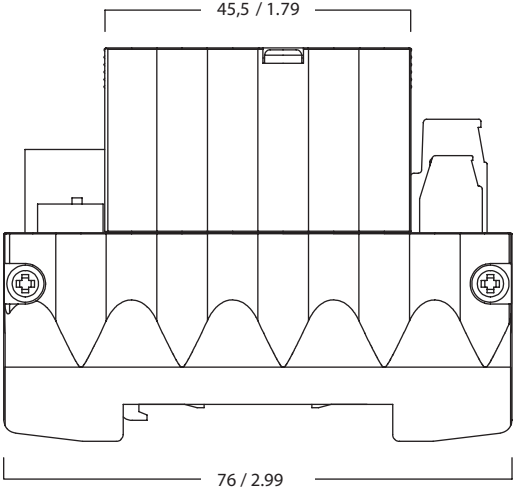
4000805

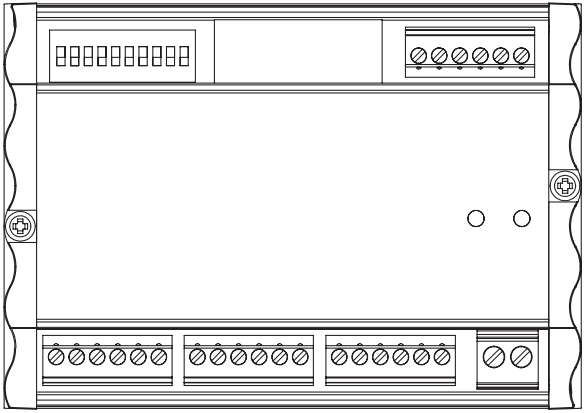
Conforms to ANSI/UL Std. 60950-1
Certified to CSA Std. C22.2 NO. 60950-1

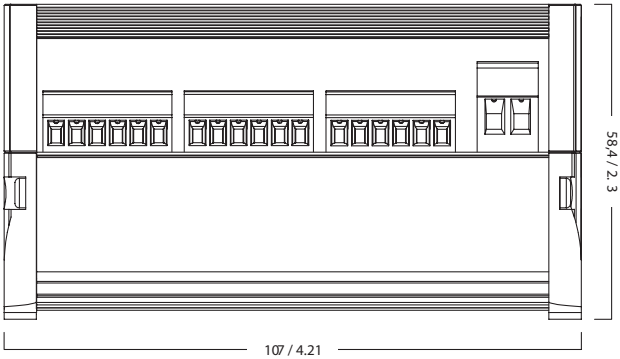
UK CA

10 Dimensions

All dimensions in mm and inch.

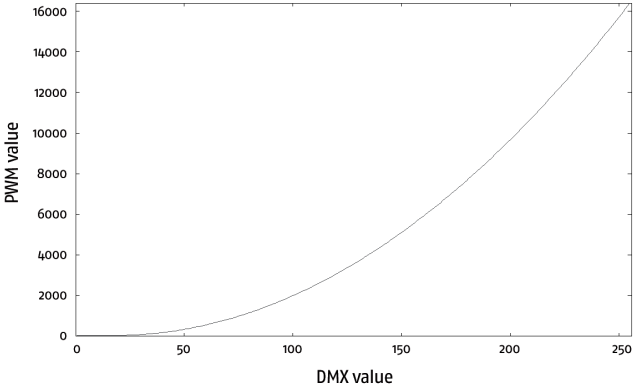





58,4 / 2.3
107 / 4.21

11 Appendix

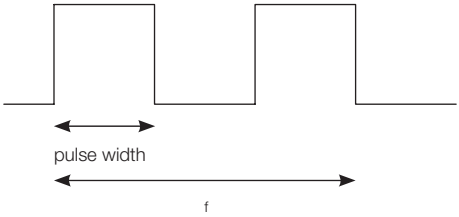
11.1 Dimming



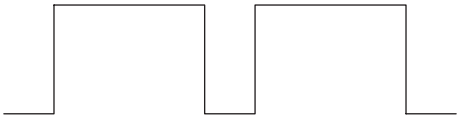
The dimming of the LEDs is accomplished by a pulse width modulation with a basic frequency of f=488 Hz. Due to the 14 bit PWM resolution, the “On-time” can be adjusted in 125 ns steps. To achieve a more “linear” impression of the LED’s brightness, a translation from the 8 bit DMX value to the 14 bit PWM resolution in form of a dimming curve is implemented.

The following picture shows the principle of PWM dimming. Please keep in mind the DMX2PWM’s switching node is a low-side switch, which means that the LED is on when the (-) connector is switched to GND (low).

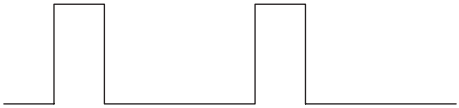
Low-Side switch: low= on, high= off 50% on-time



25% On-time



75% On-time



12 Notes

Notes

e:cue

LIGHTING CONTROL

Downloads and more information at
www.ecue.com and www.traxontechnologies.com