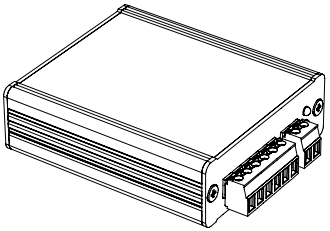
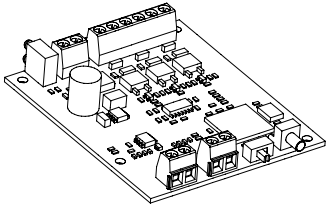
e:cue

LIGHTING CONTROL

dmx2pwm
3 channel dimmer

setup manual





dmx2pwm 3ch dimmer – setup manual
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table of contents

1. device overview

Dear valued customer,

thank you very much for purchasing this product. The dmx2pwm 3 channel dimmer is intended to be used in conjunction with fixed voltage LED lighting equipment. The most important device features are listed beside.

key features

- LED dimming using pulse width modulation (PWM)
- for use with constant voltage fixtures
- three outputs individually controllable via DMX
- two user selectable DMX addressing modes:
  auto addressing or manual addressing
- input voltage range: 12 – 48 VDC
- max. output current of 2.5A per channel
- DMX output for chaining multiple devices
- lowside switching
- reverse supply protection
- 14bit PWM resolution calculated from 8bit DMX value
- overcurrent protection (self resetting)
- two status LEDs
- two options available
  mounted in aluminium extrusion housing
  or PCB-only version

2. delivery content

- dmx2pwm 3ch dimmer # 160125

or dmx2pwm 3ch dimmer
PCB version # 160124

- this setup manual

housing version only:

- 2-pin screw terminal plug (power supply)
- 6-pin screw terminal plug (LED connection)

3. hardware installation

3.1 interfaces & cabling

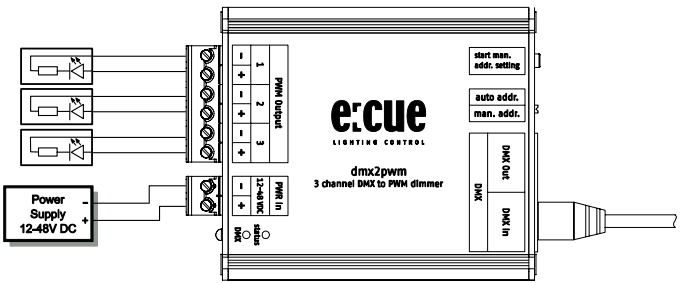
For the use of the dmx2pwm dimmer device a DC power supply unit is necessary. The choice of the power supply voltage only depends on the supply voltage of your LED fixtures, but must remain in the range from 12V to 48V DC.

Always select the power supply output voltage accordingly to your LED fixture input voltage.

- 12V PSU for 12V LED
- 24V PSU for 24V LED
- 48V PSU for 48V LED

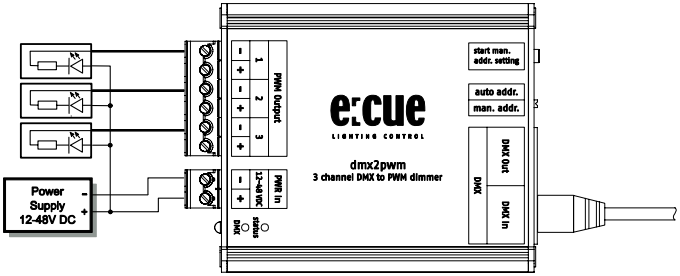
Please consider that the power supply must be able to provide the current for the connected LED fixtures and the dmx2pwm dimmer. Multiple LED fixtures where each one needs a different voltage level cannot be used with one dimmer device at the same time.

The "+" line of the Power supply connection (PWR In) is directly routed to the "+" connection 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 figure below.



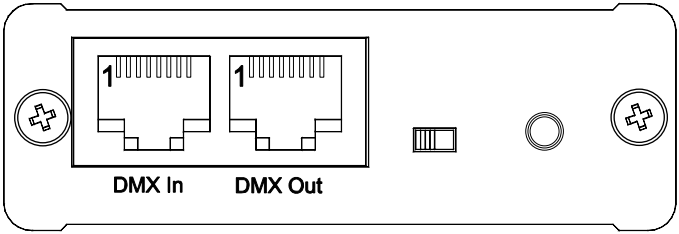
alternative connection scheme

Make sure that the power supply cables are specified to carry the complete amount of current needed by the connected LED fixtures.

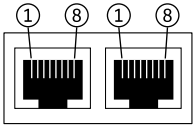
The PWM switching node is designed as a low-side switch and is able to handle a maximum current of 2.5A. Each output channel is short circuit protected. As soon as an overcurrent or short circuit situation is detected, the switch of the corresponding channel will immediately shut down. The yellow STATUS LED is blinking to signal the over-current error. The dimmer tests the output repeatedly if the overcurrent still exists. It will re-enable the output as soon as the overcurrent or short circuit is removed.

3.2 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. 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.



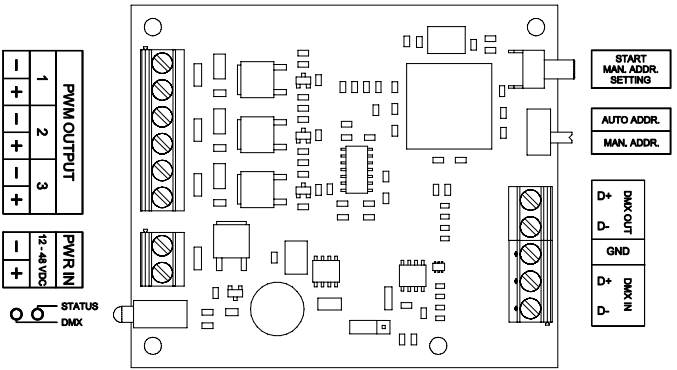
pin	description
1	DMX –
2	DMX +
3+7	GND



3.3 PCB version connectors

The PCB version has slightly different connectors than the housing version. All connectors including the DMX port are screw terminals. Please refer to the figure below when integrating the dmx2pwm PCB version into customized applications.

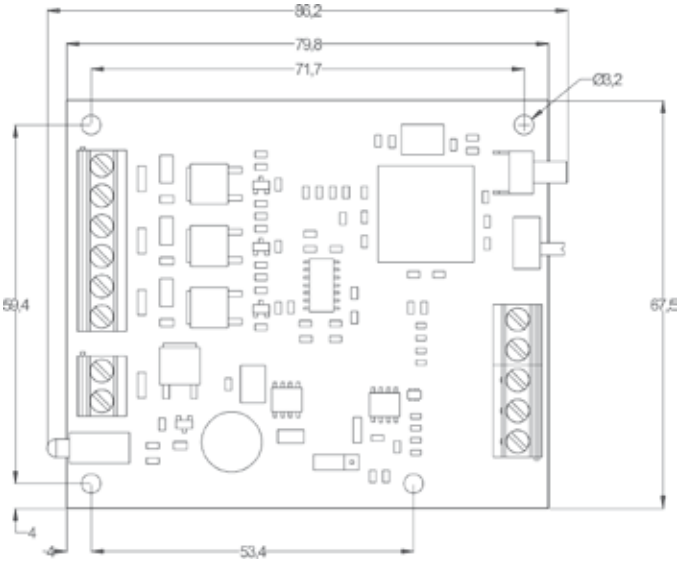
The DMX GND connection should only be used, if multiple dmx2pwm devices are connected in a chain and are sourced by different power supplies. If you experience data transmission problems in such a configuration, connect all devices in the chain to GND.



3.4 mounting

The housing version of the dmx2pwm dimmer is designed as a desktop version. There are no dedicated mounting points available.

The PCB version is designed to be used in customized applications. The following image shows the positions of the mounting holes.
All dimesions in mm. (1 mm = 0.039 inch)



4. device setup

4.1 manual address setting

Since the dmx2pwm dimmer has no switches for setting up the DMX address directly, it is possible to configure the first DMX address for the device by sending a DMX data frame. To use manual addressing, the switch must be set to “MAN. ADDR.”. When pressing the button “START…” for at least 1 second and then releasing, the DMX LED starts blinking. The device now starts to listen and waits for a DMX configuration data frame. The first received DMX data byte which is not zero is used as the device’s base address (address of PWM output 1).

Example: The first received DMX data byte other than zero is located at address 11 when the device is in listening mode. Address 11 will now be stored as address for PWM output channel 1. Channels 2 and 3 are then automatically configured the address 12 and 13. The base address is stored into a non volatile memory so that address is present after repowering the device.

To abort the listening mode without any changes, simply press the button for less than one second. The STATUS LED stops blinking.

To reset the device to base address 1 without sending a configuration data frame, press and hold the button for one second. The DMX LED starts blinking. Then press and hold the button for one second again. The DMX LED stops blinking and the address is set back to 1. It is of no importance whether the DMX cable is connected or not.

4.2 auto addressing mode

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, 2 and 3. The next one, which is connected to the DMX-Out connector of the previous one, uses addresses 4, 5 and 6 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 1:
The first device in the chain has the base address 6 (and also occupies addresses 7 and 8), the next device has the base address 9.

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, 3 and 4 and the next device uses address 8, 9 and 10.

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

4.3 status LEDs

LED	description
DMX off or flickering	No DMX signal recognized or not connected
DMX on	DMX present
DMX blinking	Awaiting DMX data frame for manual address setting
STATUS off	Power supply not connected
STATUS on	Normal operation
STATUS blinking	Overcurrent detected on one or more channels

5. technical data

5.1 technical specifications housing version

order code	
pmx2pwm housing version	# 160125
general specifications	
dimensions mm / inch (WxHxD)	94 x 71,5 x 24 mm / 63.66 x 2.81 x 0.94 inch
weight kg / lbs	0,08 kg / 0.176 lbs
power	12–48 VDC (screw term.)
operating / storage temp.	–20°...80°C / –4°...176°F
operating / storage hum.	0–80%, non condensing
environment	IP20
housing	alu
certifications	CE (EN55015 / EN61547)
interface specifications	
input	DMX512 (RJ–45)
output	DMX512 for chaining multiple devices 3 putput channels (screw terminals) + connector: identical to input voltage – connector: low side PWM switch
ratings	
device type	lamp control gear
supply voltage	0.6 W (idle, all channels off, DMX connected)
output current per channel	2.5 A (0vercurrent protection, ±10%)
max. output load capacitance	1µF
overcurrent retry delay	1 sec.
minimum on time	2.5 µs
PWM frequency	488 Hz
PWM resolution	14 bit (optimized dimming curve calculated from 8bit DMX value)
data transmission	DMX512 and e:pix
max. devices in a chain	32 (depends on cable length and quality)
max. wire cross section (screw terminal)	1.5 mm2 (for Power supply and PWM outputs)

5.2 technical specifications PCB version

order code	
pmx2pwm PCB version	# 160124
general specifications	
dimensions mm / inch (WxHxD)	80 x 67,5 x 16 mm / 3.15 x 2.66 x 0.63 inch
weight kg / lbs	0,04 kg / 0.088 lbs
power	12–48 VDC (screw term.)
operating / storage temp.	–20°...80°C / –4°...176°F
operating / storage hum.	0–80%, non condensing
environment	IP20
housing	only PCB, no housing
certifications	CE (EN55015 / EN61547)
interface specifications	
input	DMX512 (RJ–45)
output	DMX512 for chaining multiple devices 3 putput channels (screw terminals) + connector: identical to input voltage – connector: low side PWM switch
ratings	
device type	lamp control gear
supply voltage	0.6 W (idle, all channels off, DMX connected)
output current per channel	2.5 A (0vercurrent protection, ±10%)
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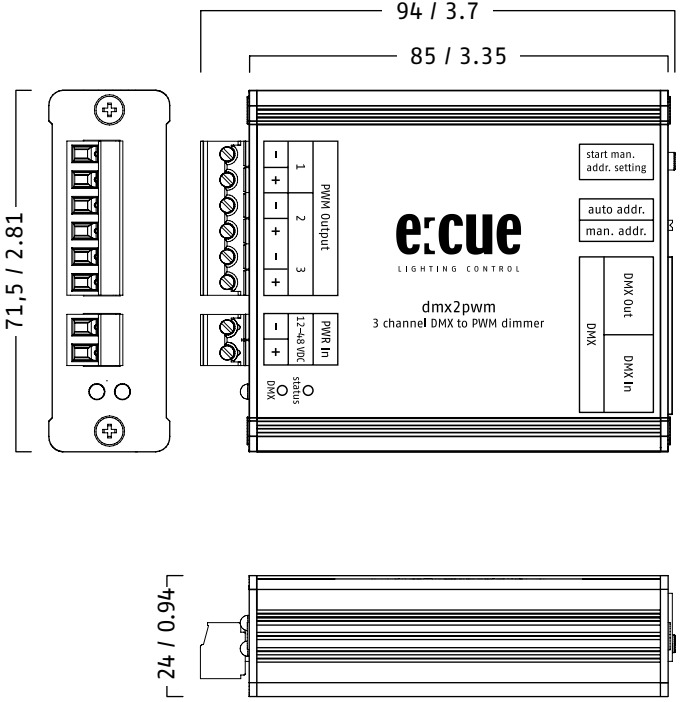
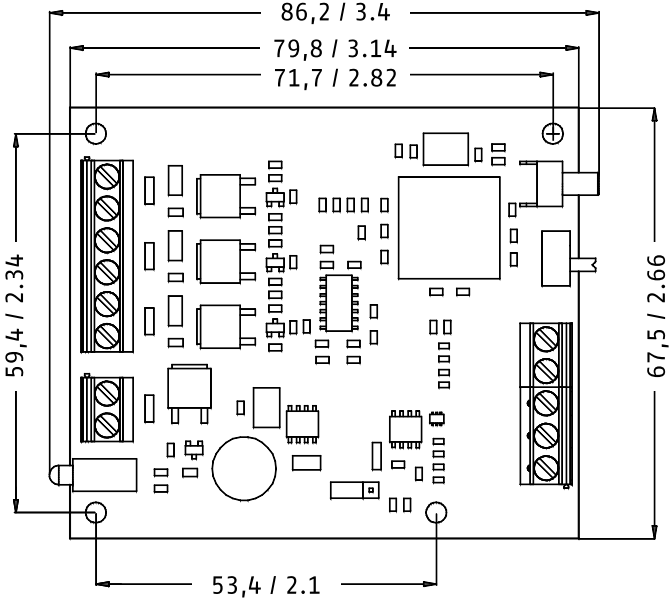
max. devices in a chain	32 (depends on cable length and quality)
max. wire cross section (screw terminal)	1.5 mm2 (for Power supply and PWM outputs)

5.3 dimensions

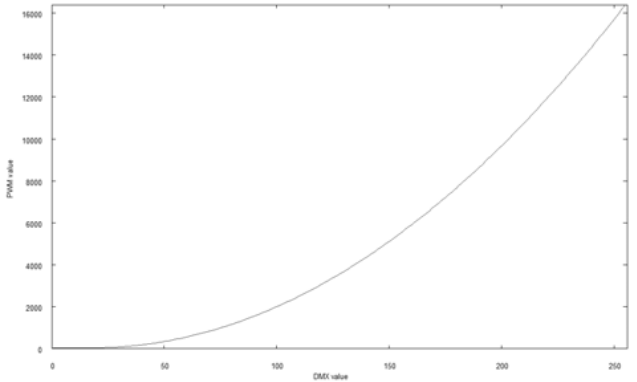
All dimensions in mm and inch
(mm/inch).




86,2 / 3.4
79,8 / 3.14
71,7 / 2.82
59,4 / 2.34
67,5 / 2.66
53,4 / 2.1

6. appendix

6.1 dimming curve



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

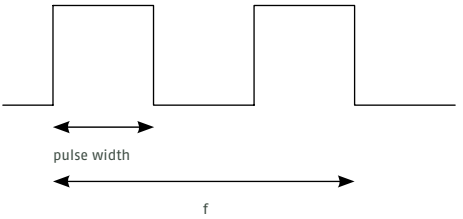
The following picture shows the principle of PWM dimming. Please keep in mind the dmx2pwm’s switching node is a low-side switch, which means that the LED is on when the (-) connector is switched to GND (low).

dmx2pwm 3ch dimmer – appendix

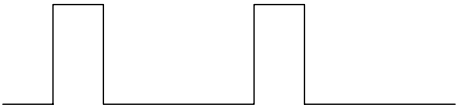
Low-Side switch:

low= on, high= off

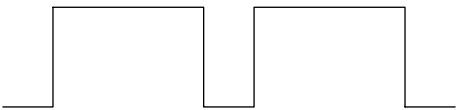
50% On-time



75% On-time



25% On-time



6.2 external power source jumper

The housing version of the dmx2pwm is equipped with a jumper (J1) to enable power sourcing on the DMX-In connector pin 5. The default setting at delivery is “off” (position 2-3). When enabled (position 1-2), the power supply is directly routed to pin 5 of the RJ45 connector. This is especially useful when using the dmx2pwm in combination with the glass touch user terminals from e:cue. No other additional power supply is needed.

6.3 warning notices

The maximum power supply voltage is limited to 24V DC in combination with glass touch series!

To access the jumper, remove the housing’s front and remove the PCB. The electronic components are very sensitive to electrostatic discharge (ESD). Hold the PCB only by its edges and be careful not to touch the components. Please do all preparation work on a static-free surface. It is recommended to wear an antistatic wrist strap.

Any usage other than described in this manual is not permitted, can damage the device and lead to associated risks such as short-circuit, fire or electric shock. If not otherwise noted, no part of the product may be modified or rebuilt.

When selecting a power supply for your lighting application, choose one which is compliant to EN55015/EN55022 Class B and EN61000-3-2 Class C for the expected load. The power supply should be equipped with an active PFC circuit for loads higher than 25W.

6.4 EMC

The dmx2pwm 3 Channel dimmer is certified according to

EN 55015 & EN 61547

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