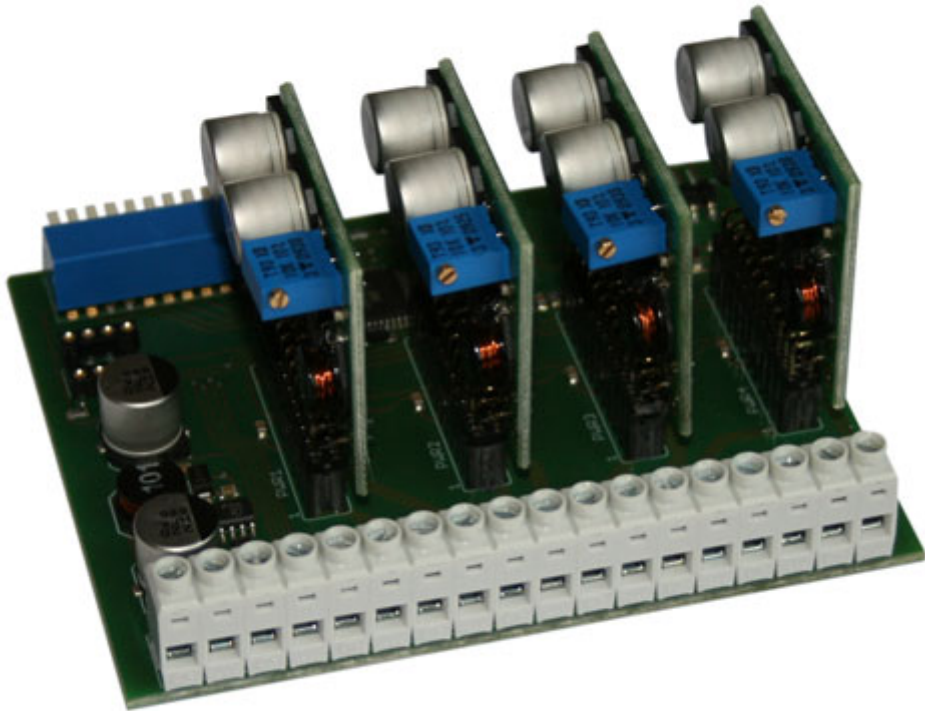


# DMX-LED-Dimmer

## BB4

4x 330mA - 1500mA

User Manual



DMX<sup>®</sup>  
ALL



For your own safety, please read this user manual and warnings carefully before installation.

## Description

The **DMX-LED-Dimmer BB4** is designed to control LEDs, which operate with constant current and works with up to 24V of the LED voltage.

### Regulable output current

The DMX LED Dimmer BB4 has 4 outputs where the LEDs are operated with a current of 0 to 330mA-1500mA. The level of the output current can be adjusted via DMX.

### LED-State-Display

The integrated multifunctional display shows the current status of the device.

### DMX-Master-Dimmer

The DMX-LED-Dimmer BB4 has various Master Dimmers. These are activated by jumpers 1 and 2.

### Call up internal color changes

Internal color changes can be called up via DIP switch 10.

### Up to 1024 brightness steps

Each output driver has a resolution of 1024 steps in which the output current is controlled. The special driver design allows a constant current which is not modulated by a PWM for the dimming process.

### Two adjustable operation modes

Control with 2 DMX channels per output, the first DMX channel allows coarse control and the second DMX channel allows fine control.

### Curve Definition

The Curve Definition generates an individual LookUp table for each output. This can be created using a PC tool. A connecting cable is available as additional accessory for transfer to the interface.

### Suitable for top hat rail mounting

The top-hat rail housing 1050 is available as optional accessory for the DMX LED Dimmer BB4.

## Technical Data

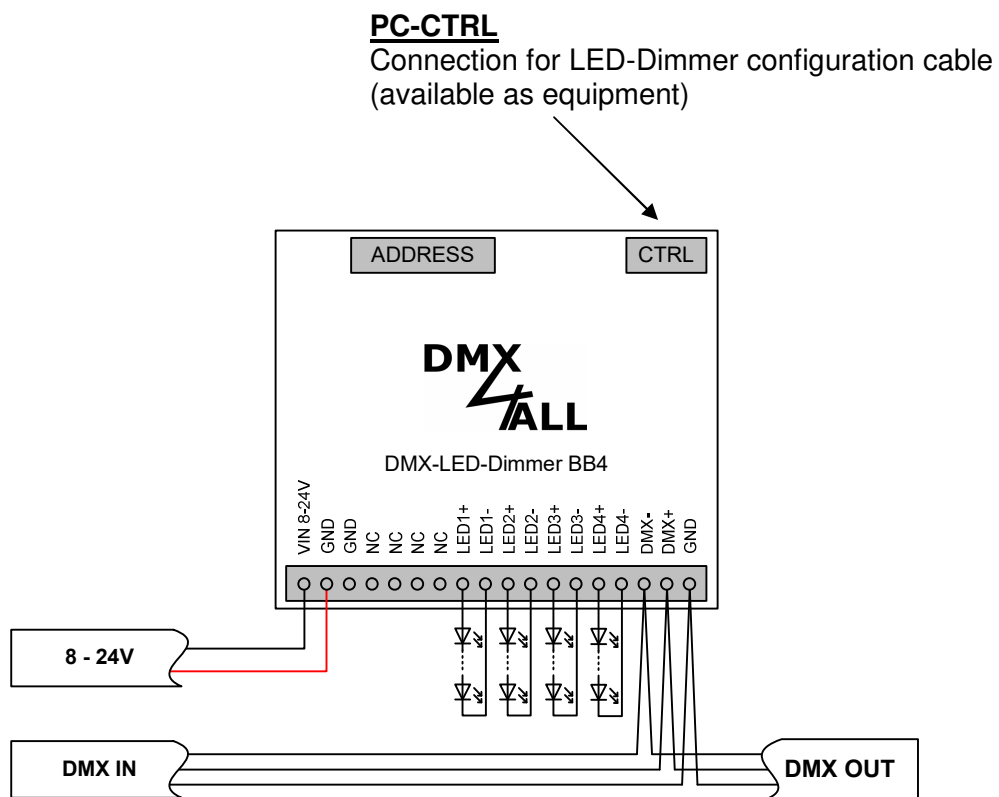
Power supply:	8-24V DC (maximum 26V) 50mA (without connected load)
Drop voltage:	max. 2V
Output current:	4x 0 – settable output current (330mA – 1500mA) Sustained short circuit / 1024 steps at each output
Operation modes:	each output 1 DMX channel with internal table or 2 DMX channels per output for 10-bit control
DMX channels:	4-9 channels depending on configuration Channel 1 / Channel 1+2 = output current 1 Channel 2 / Channel 3+4 = output current 2 Channel 3 / Channel 5+6 = output current 3 Channel 4 / Channel 7+8 = output current 4 Channel 5 = Master Dimmer (activatable)
PWM-Frequency:	No PWM at the output
Operation temperature:	0°C up to +45°C Thermal overload protection per output
Connection:	Screw terminals
Heights:	47 mm
Dimensions:	99mm x 82mm

## Connections

**Attention:**

Don't connect the clamps among each other, e.g.  $V_{IN-}$  (input) and the clamp LED (output) or the several LED clamps !!!

Don't connect the single negative outputs to the LEDs among each other !!! Not only the LEDs will be destroyed but also the drivers.

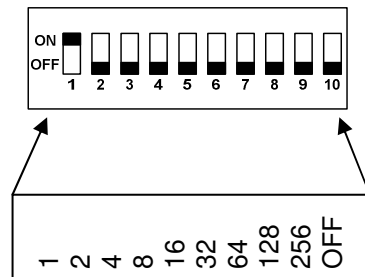


## Setting the DMX-Starting address

The DMX start address is adjustable via switches 1-9.

Switch 1 has the valency  $2^0$  (=1), switch 2 has the valency  $2^1$  (=2) and so on... finally switch 9 has the valency  $2^8$  (=256). Each Switch, which is moved to ON position, represents the start address.


Switch 10 is stored for special functions and is to leave on OFF via DMX in the normal mode.



## Set output current

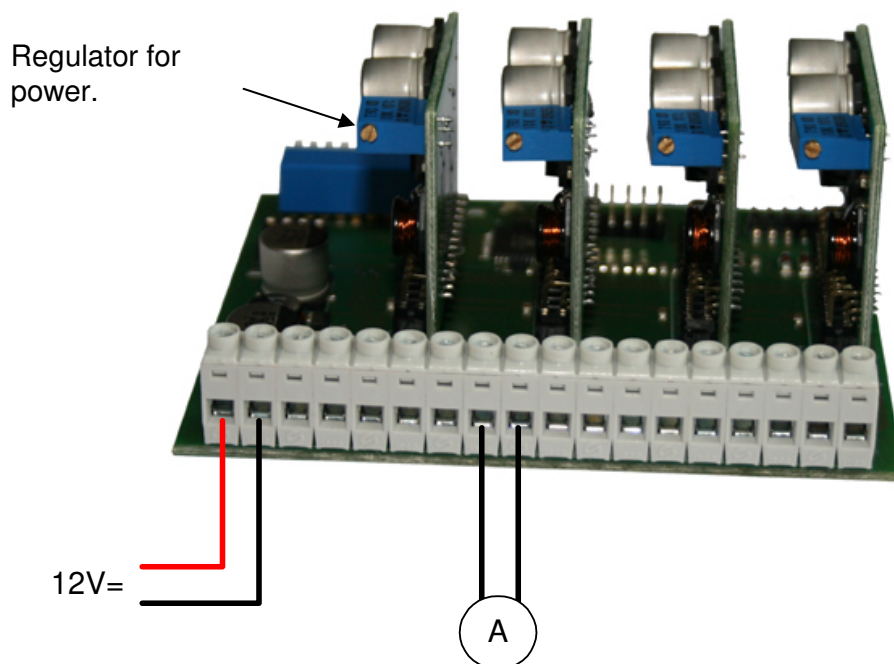
Each output has a regulator for settings adjusting the maximal output current.


The output current is in the range from 330mA up to 1500mA.

 Before connecting a LED to an output please adjust the suitable operating current for the LED !!! Only in this case a safety use can be guaranteed.

For adjusting the output current, please proceed as follows:

- Set up the DIP-switch 1 up to 5 and 10 to ON
- Connect the power supply
- Now connect a current measurement device to the LED-outputs. The measure range should not be chosen higher than 2A.
- Please adjust now the LED-operating current with help of the regulator for settings.
- Repeat this measuring and adjusting for every channel.



 To get an optimal result please adjust a power supply to 12V. If you use a higher power supply it is recommendable to use LED in series to the measure instrument.

## Set operation modes

The DMX-LED-Dimmer BB4 has 2 operation modes which are adjustable with Jumper 3:

### **Jumper 3 open: Controlling the outputs about a single DMX-channel**

The output resolution of 1024 steps will be adjusted to the 256 steps of the DMX-values with a LookUp-table (Curve Definition). This LookUp-table (Curve Definition) is linear pre-programmed and editable for every single output.

### **Jumper 3 closed: Controlling the outputs about two DMX-channels.**

Every output has a resolution of 10 Bit. For a direct responds 2 DMX-Channels per output are needed. The second DMX-channel is a fine adjustment.

## Service / Software-Reset

For service operation the outputs can be shut down. To do this switch 5 and 10 must be set on ON. Now, via switches 1-4 the outputs can be turned off and on.

A RESET of the DMX-LED-Dimmer BB4 into the delivery configuration is possible if you adjust the switch 1, 3, 5, 7, 9 and 10 on ON and than switching on the power supply. After executed reset the DMX-LED lights up.

## LED-Display-Codes

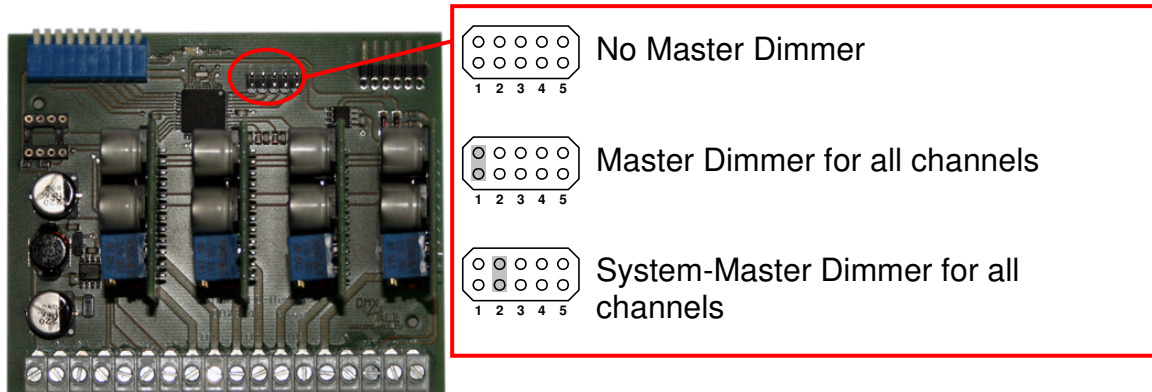
The integrated DMX-LED is a multifunctional display. In the normal operation the LED lights permanently. In this case the device is working.

Furthermore, the LED signals the events. In this case the LED lights up in short pitches and turning off for al longer period. The Number of flashing signals is equal to the Number of the error status:

Error Status	Error	Description
1	No DMX-signal	There is no DMX-signal recognized
2	Address error	Please check if there is a valid DMX start address via DIP-switches adjusted.
3	DMX signal error	An invalid DMX-Input signal is detected. Please switch the signal line at the pins 2 and 3 or use a twisted connection cable.

## DMX-Master-Dimmer

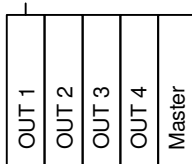
The **DMX-LED-Dimmer BB4** has different Master Dimmer. These can be activated about the jumper 1 and 2 (Jumper 3, 4, and 5 for further functions):



### Master Dimmer for all channels

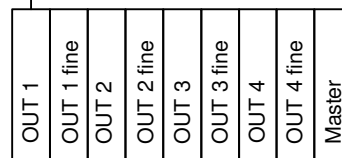
The DMX channel will be adjusted for the starting address and as Master Dimmer for all outputs. The assignment of the DMX addresses is as follows:

Start address



Jumper 3 open

Start address

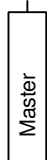


Jumper 3 closed

### System-Master Dimmer for all channels

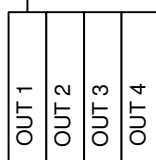
The value for the Master Dimmer depends on the DMX channel 1 which is used as Master Dimmer for all outputs. The DMX-starting address shows the DMX channel where the DMX values for the outputs begin. The DMX address assignment takes place as follows:

DMX channel 1

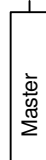


Jumper 3 open

Start address

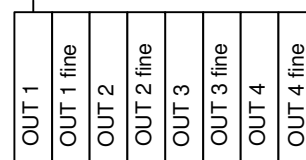


DMX channel 1



Jumper 3 closed

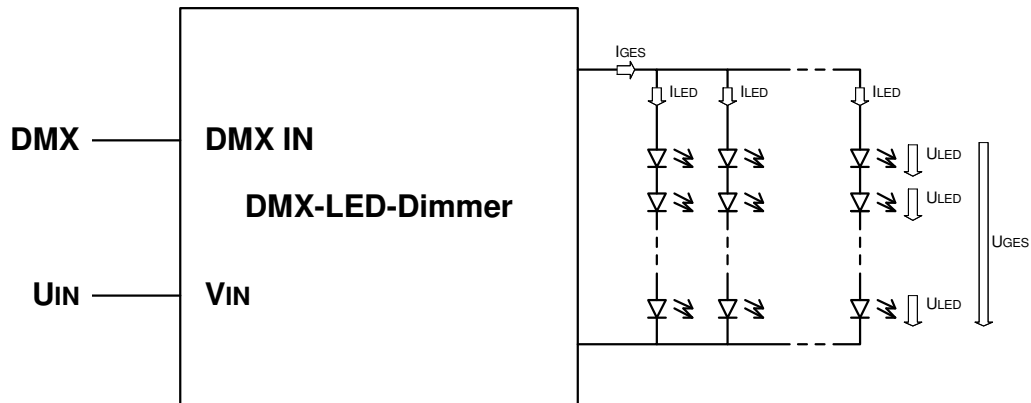
Start address





## LED Connection

The LEDs can be connected in different ways, serial and parallel or as mix.



Please keep and note the following introductions:

- Only use the same LEDs to output
- Each LED line must have an equal number of LEDs.
- $U_{GES}$  has to be lower 2V than  $U_{IN}$ .
- $I_{GES} = \sum I_{LED}$  must comply with the output electric current of the DMX-Dimmer, because the outputs are power regulated.

**Example:** 24 white 1W LED`s to an output

LED-Data:  $U_{LED} = 3,42V$  ;  $I_{LED} = 350mA$

Power supply: 24V DC

The connection takes place in 4 paths with each 6 LED's in series

$$U_{GES} = 6 * 3,42V = 20,52V$$



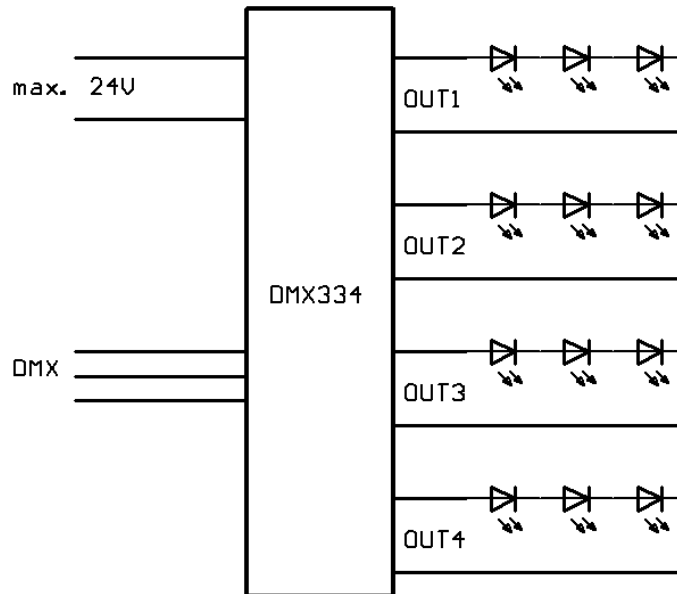
$$I_{GES} = 4 * 350mA = 1400mA$$



## Examples for the LED-connection

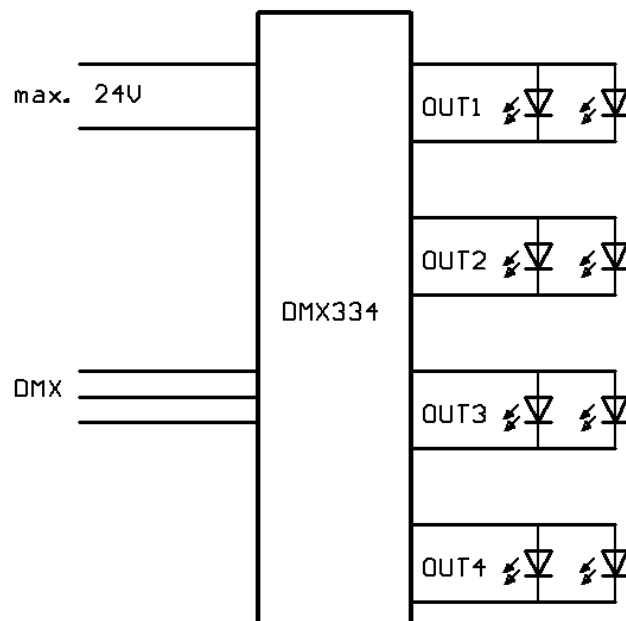
### Example 1:

Series Connection for LEDs gets the same operation current per LED. The sum of the LED voltage at the output has to lay 2V lower to the operation current.



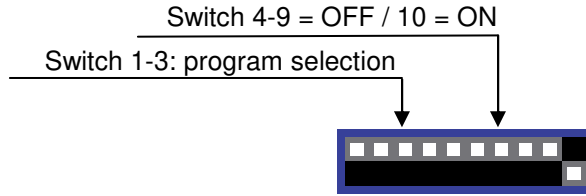
### Example 2:

Parallel connection for LEDs the power supply will be shared to the single LEDs. The sum of the LED operation flows has to be in accordance to the LED dimmer!



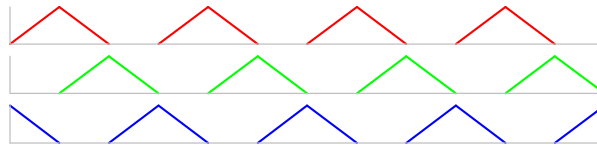
## Calling the internal colour changes

You can call the internal colour change by turning switch 10 on ON. Now you can adjust the colour change programs via the switches 1 up to 3.

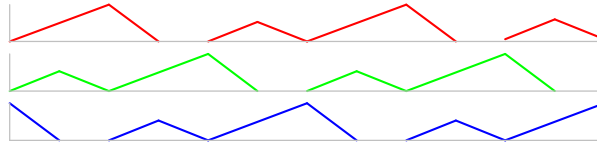


The following colour changes are possible:

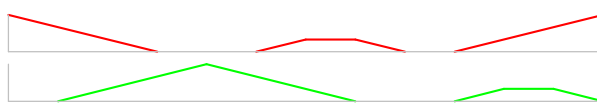
Color change 1:



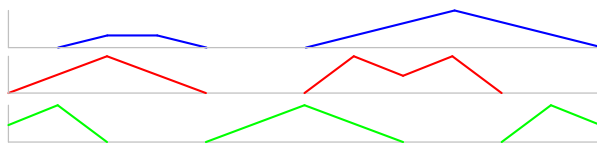
Color change 2:



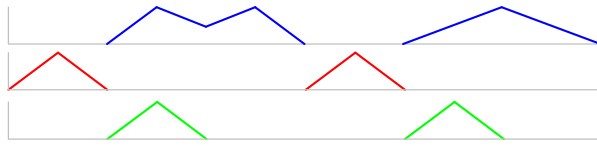
Color change 3:



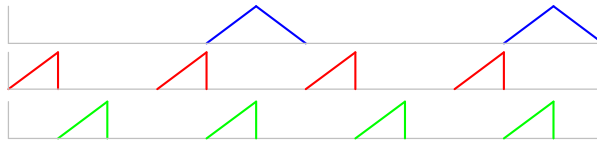
Colour change 4:



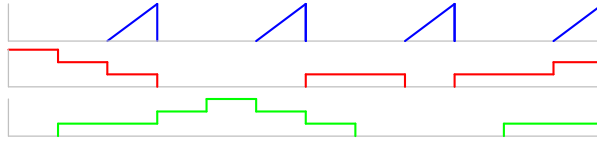
Color change 5:



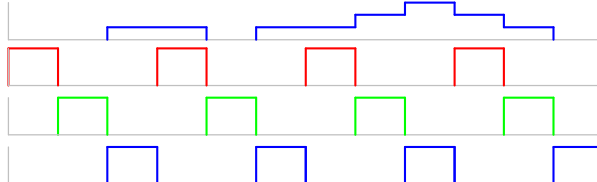
Color change 6:



Color change 7:

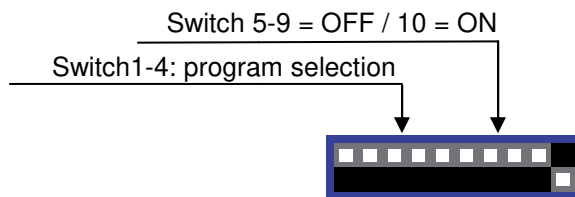


Color change 8:



## User-defined color change

The **DMX-LED-Dimmer BB4** provides the option to program up to 16 colour changes by using an EERPOM. This can be used if an EEPROM Type 24C64, 24C128 or 24C256 is installed at the IC-socket. Switch 1-4 offers a menu selection for light samples. Move switches 5-9 to OFF and switch 10 to ON to use a user-defined colour change.



### Creating a color change

The colour change will be generated with the help of the DMX-Configurator. The adjustable DMX channels 1-4 are in accordance to the outputs 1-4. The assignment of the programmable scenes to the selectable light pattern is equal. So, the first scene is equal to the first light pattern (all switches OFF).

Generating the light pattern with the DMX-Configurator is described detailed in the user manual for the program.



The time units specified by creating the light patterns can differ by replaying. These are only standard values.

Are the wanted light patterns created, you must generate a programming file for the EEPROM under *File* → *Export HEX-File*. This file must be written into the EEPROM with a customary programming device or with the help of a PC-cable the file must be written directly into the DMX-LED-Dimmer BB4.

## Configuring the LookUp-table

The **DMX-LED-Dimmer BB4** has a LookUp-table for every output. The received DMX-channel has values between 0-255. The DMX-LED-Dimmers output driver offers 1024 steps (0 up to 1023) which will be assigned to the DMX-values.

So, it is possible to effect small steps in the output currents (in the bottom brightness range) for lower brightness changings. On the other hand, in the higher brightness range it is possible to program bigger steps in the output current.

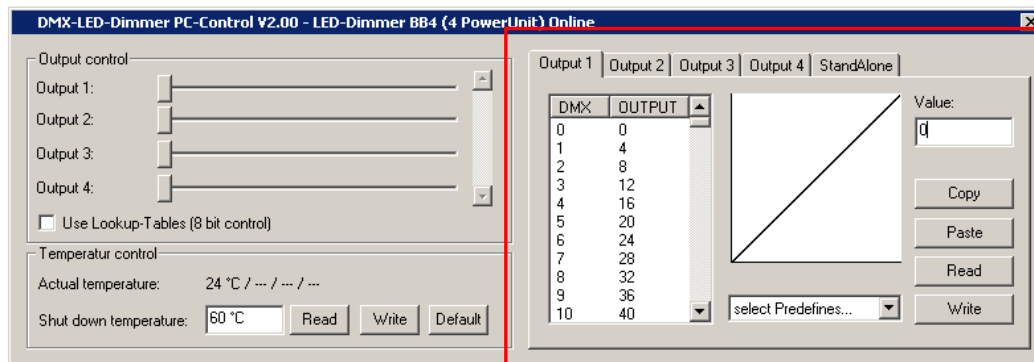


A PC connection cable and a USB connector on the PC are required for communication with the DMX LED dimmer BB4.

Connect the cable with the PC and the PC-CTRL-connector from the DMX-LED-Dimmer BB4.

Adjust the switch 1-8 on OFF and switch 9 and 10 on ON to get into the PC-mode.

The definition for the LookUp-table takes place via the software PC-Control. There is a table with DMX values 0-255 and the associated output values for every output. A graphically representation illustrates the output characteristic.



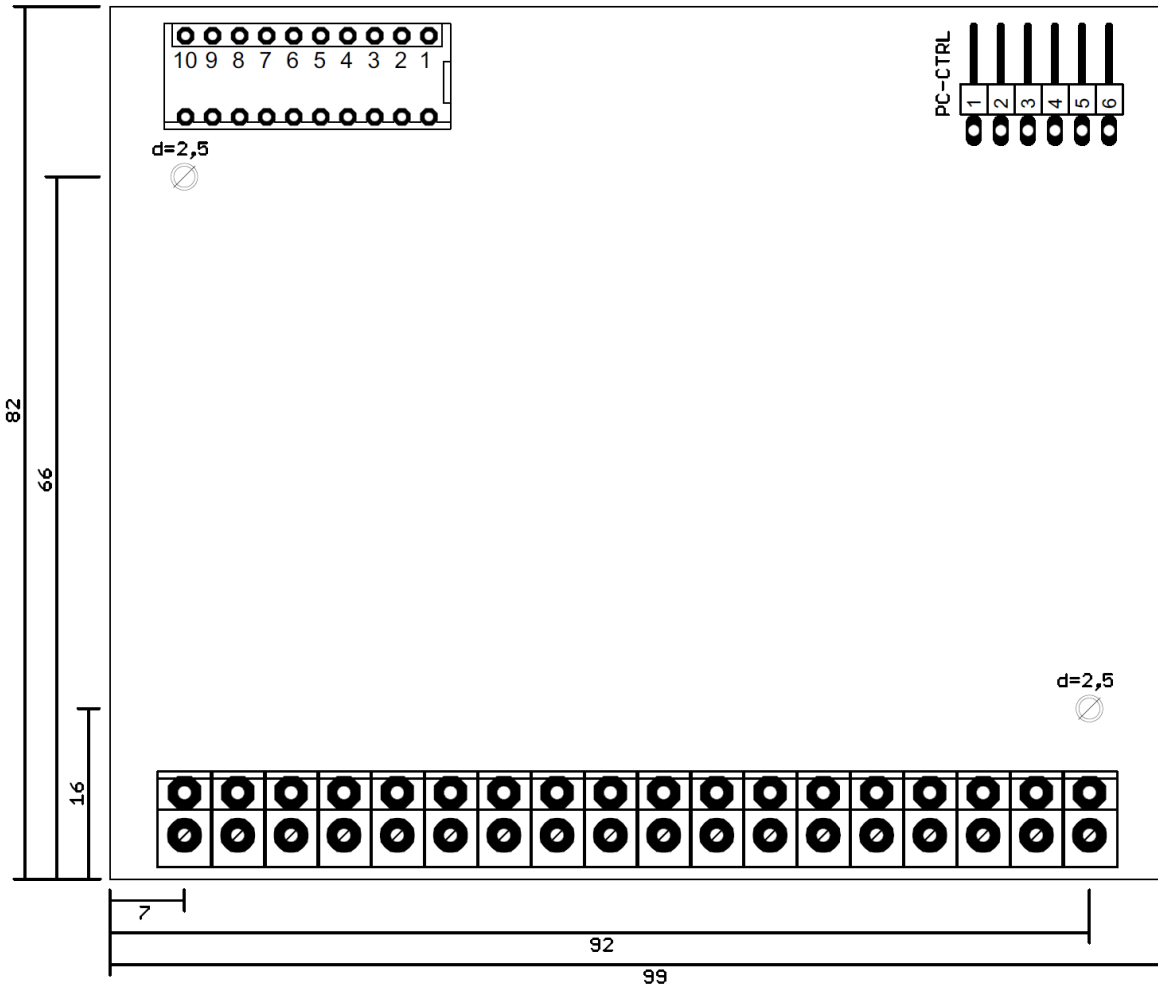
For transferring the table into the DMX-LED-Dimmer BB4 a connecting cable and a USB-connection is necessary. Please connect the cable with the PC and the PC-CTRL-connection from the DMX-LED-Dimmer BB4. Adjust the switch 1-8 on OFF and switch 9 and 10 on ON to get into the PC-mode.

Select **Write** to transfer the table for the displayed output.



During an activated PC mode there must be no DMX signal !

# Dimensions



All details in mm

## Equipment

**Module enclosure 1050 for DIN-rail**  
for top-hat rail mounting



**LED-Dimmer configuration cable**

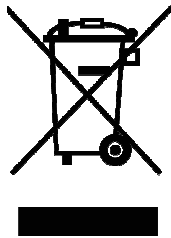


## CE-Conformity



This assembly (board) is controlled by a microprocessor and uses high frequency. In order to maintain the properties of the module with regard to CE conformity, installation into a closed metal housing in accordance with the EMC directive 2014/30/EU is necessary.

## Disposal



Electronical and electronic products must not be disposed in domestic waste. Dispose the product at the end of its service life in accordance with applicable legal regulations. Information on this can be obtained from your local waste disposal company.

## Warning



This device is no toy. Keep out of the reach of children. Parents are liable for consequential damages caused by nonobservance for their children.



## Risk-Notes



You purchased a technical product. Conformable to the best available technology the following risks should not be excluded:

### **Failure risk:**

The device can drop out partially or completely at any time without warning. To reduce the probability of a failure a redundant system structure is necessary.

### **Initiation risk:**

For the installation of the board, the board must be connected and adjusted to foreign components according to the device paperwork. This work can only be done by qualified personnel, which read the full device paperwork and understand it.

### **Operating risk:**

The Change or the operation under special conditions of the installed systems/components could as well as hidden defects cause to breakdown within the running time.

### **Misusage risk:**

Any nonstandard use could cause incalculable risks and is not allowed.

**Warning:** It is not allowed to use the device in an operation, where the safety of persons depend on this device.

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