

DigiLED DMX CA

WU-ST-003-DigiLED-DMX CA (Ref. No.: 186153)



A New Lighting Experience

1 Introduction

1.1 Product Description

DigiLED DMX CA units are designed to enable individual colour control of LED modules in 24 V CA assembly systems. The digital interface was designed in compliance with the DMX512 standard (DIN 56930-2) and is therefore suitable for connection to DMX512 control units.

The DMX transfer protocol (digital multiplex for 512 channels) is used for controlling DigiLED DMX CA units. This standard was defined by the United States Institute for Theatre Technology (USITT). As a system control device, DigiLED DMX CA serves to control the brightness of high- and/or low-power LED modules that are of common anode design. Please refer to the publication entitled "USITT: DMX512/1990 Digital Data Transmission Standard for Dimmers and Controllers" for the full wording of the DMX512 standard.

2 Description of Functions

2.1 Functional Characteristics

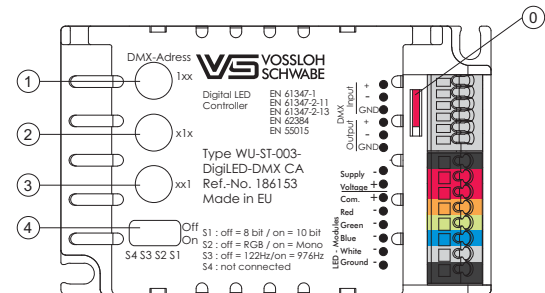
The software integrated in a DigiLED DMX CA unit uses DMX signals to generate the four PWM control signals (RGBW) needed for colour control of LED modules in a 24 V CA system. The four PWM control signals are assigned in accordance with the DMX address to which the DigiLED DMX CA unit was set (see 2.2.1).

The set DMX address is recognised and stored as soon as the unit is connected to the supply voltage. Any changes made to the DMX address will only be recognised and stored if the DigiLED DMX CA unit is disconnected from the supply voltage for a minimum of 5 seconds before being reconnected.

Technical Specifications:

- 1 x DMX input to connect DMX-compatible control units; polarity must be observed
- 1 x active DMX output for transferring and amplifying the DMX signal; polarity must be observed
- 4 x PWM outputs (RGBW)
- Control signal range: 0 % ... 100 %
- All channels are protected against short-circuiting and overload: in the event of short-circuiting, the channel will make five attempts to restart. Should these remain unsuccessful, the respective channel will shut down. Once the problem has been eliminated, the channel must be restarted (24 V supply)
- Overheating protection: should the t_c temperature be exceeded, the output circuit will automatically shut down. Once the problem has been eliminated (i.e. the device has cooled down again sufficiently), the unit will restart automatically
- A BUS termination resistor can be activated (see 2.2.2)

2.2 Settings



2.2.1 Using the Decimal Switch to set DMX Addresses

Any address between 001 and 509 can serve as the basic setting, i.e. as the start address that will be activated every time the device is switched on. Please note that setting a start address will also occupy the next three addresses.

For instance, if the start address is 111, then 112 to 114 will also be assigned. Decimal switches (1) to (3) are used to set an address, whereby (1) is for the hundred position, (2) is for the decimal point and (3) is for the unit position.

Using "000" as a start address will automatically activate the manufacturer's factory settings and result in an orange shade in RGB modules. Similarly, setting an address higher than 509 will also activate the manufacturer's factory settings.

2.2.2 DMX-BUS Termination

A resistor termination must be fitted to the final receiver of each DMX512 transmission line. DigiLED DMX CA units are pre-equipped with such a resistor, which can be activated or deactivated using a sliding switch (0). The switch is in the "OFF" position in the diagram shown above.

2.2.3 DIP Switch Assignment

The following operating parameters of a DigiLED DMX CA unit can be set using the DIP switch (4):

- S1: Switch from 8- to 10-bit resolution; the 10-bit mode logarithmically improves the scaling accuracy of the dimmer, which permits more precise control when light intensity is low.
- S2: Switch from RGB(W) to mono operation, which switches all four output channels to behave in an identical manner to channel 1.
- S3: Switch the PWM frequency of 122 Hz to 976 Hz: The high frequency is particularly suitable for applications in recording studio environments (e.g. film or TV).
- S4: Not assigned

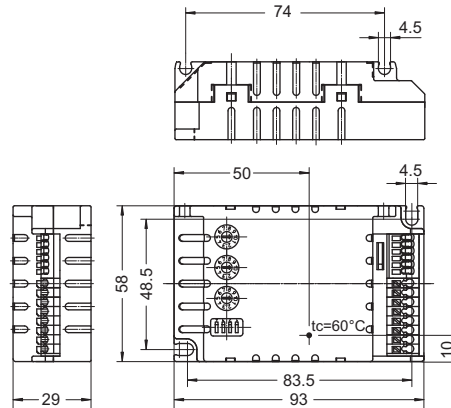
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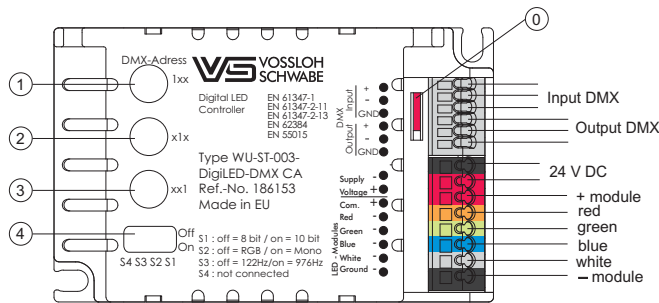


3 Technical Data

Operating Voltage	23 to 25 V DC
Current consumption	max. 5 A (see table 4.2)
Fuse protection	T5 A 250 V, safety fuse
Connection	8-pole push-in terminal for supply voltage and LED assembly modules in 24 V CA system (see table 4.2) 6-pole push-in terminal for the DMX512 interface
Ambient temperature	-20 °C to +45 °C
t _c point	max. 60 °C
Degree of protection	IP20
Casing	Plastic, PC white
Dimensions (LxWxH)	95 x 60 x 30 mm
Weight	75 g



4 Terminal Connections



4.1 DMX Terminal

Terminal	Function	Recommended Lead	Product
● Input DMX +	+ Connection for DMX signal (input)	BUS line with an impedance value of 120 Ohm	DMX unit
● Input DMX -	- Connection for DMX signal (input)		
● Input GND	Ground (possibly for shielding the DMX line)		
● Output DMX +	+ Connection for DMX signal (output)		
● Output DMX -	- Connection for DMX signal (output)		
● Output GND	Ground (possibly for shielding the DMX line)		

4.2 Terminal Block 24 V and Module Connection

Pole	Colour Coding	Max. Current Carrying Capacity	Function	Recommended Lead	Connection
1	● Black	5 A	Supply line for optional 24 V converter (GND)	Standard two-strand supply lead (0.5-1.5 mm ²)	24 V DC converter
2	● Red	5 A	Supply line for optional 24 V converter (+24 V)		
3	● Red	5 A	Supply line for LED assembly modules (+24 V)	High Power feed in cable (Ref. No. 535900)	LED assembly modules or module group for 24 V CA system
4	● Orange	1.25 A	PWM signal line for channel 1/Red		
5	● Green	1.25 A	PWM signal line for channel 2/Green	Standard six-strand lead (e.g.: UYY 6X0.75 mm ²)	or PCB distributor or slave board for 24 V CA system
6	● Blue	1.25 A	PWM signal line for channel 3/Blue		
7	● Grey	1.25 A	PWM signal line for channel 4/White		
8	● Black	5 A	Supply line for LED assembly modules (GND)		

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5 DigiLED DMX CA Connections

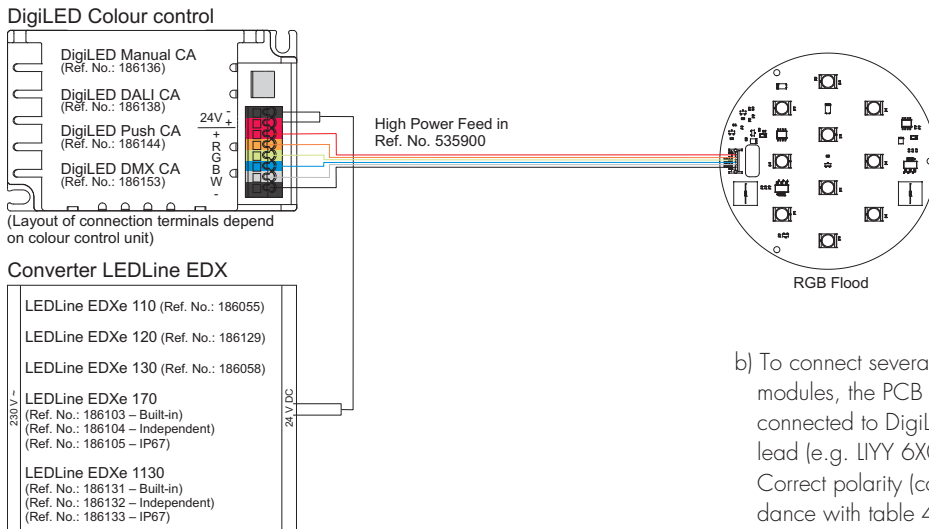
5.1 Input and DMX Terminal

- **DMX:** Connect DigiLED DMX CA to the DMX control unit using the DMX terminal. Further DMX units can be cascaded (up to a maximum of 32 devices) by creating an active output (DMX output). In so doing, the DMX signal can be connected through from DigiLED to DigiLED unit.
- **Voltage supply:** DigiLED DMX CA is supplied with 24 V DC via terminals 1 and 2 (see table 4.2).

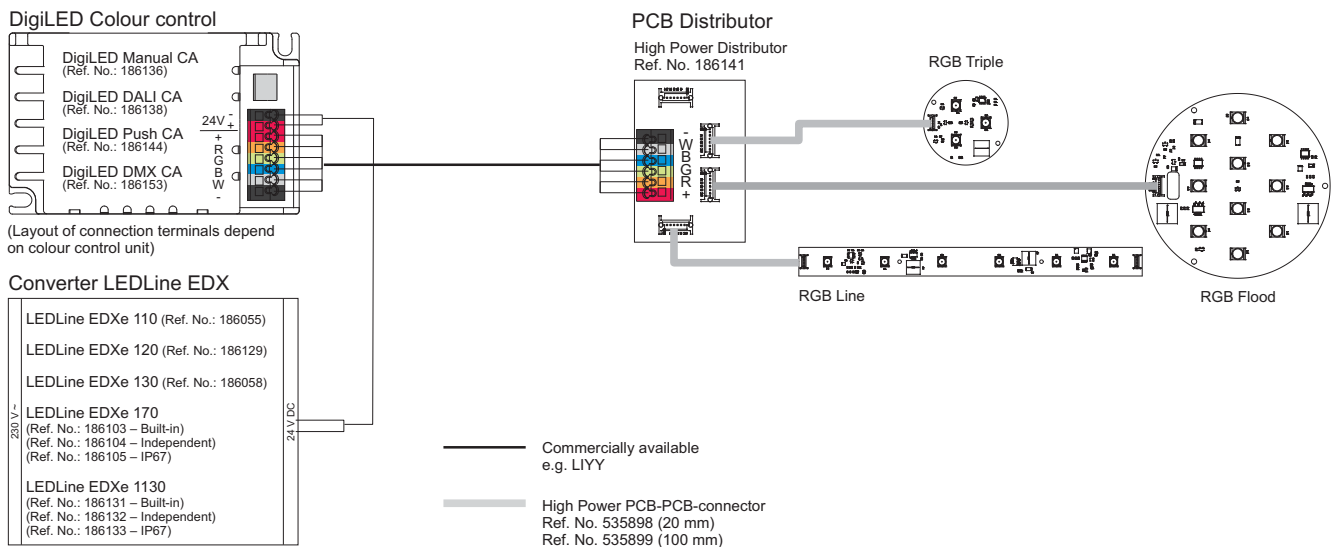
5.2 Output

5.2.1 Connection of HighPower 24 V RGB(W) LED Assembly Modules

a) The feed in cable (Ref. No. 535900) must be used to connect a HighPower 24 V RGB(W) LED assembly module. For direct connection, use terminals 3 to 8 of DigiLED DMX CA. Correct polarity (colour coding) must be ensured in accordance with table 4.2.



b) To connect several HighPower 24 V RGB(W) LED assembly modules, the PCB distributor (Ref. No. 186141) must be connected to DigiLED DMX CA using a standard six-strand lead (e.g. LIYY 6X0.75 mm²). Correct polarity (colour coding) must be ensured in accordance with table 4.2. LED assembly modules are connected to the distributor using flatband cables (Ref. No. 535898 or 535899).



The maximum number of connected LED assembly modules is limited by the power rating of the converter and by the max. current load of the outputs in accordance to table 4.2. The power and current draw values of the connected LED assembly modules as well as connection cable and PCB distributor data can be found in the respective data sheets at www.vsoptoelectronic.com.

The maximum power rating for a DigiLED DMX CA unit totals 120 W.

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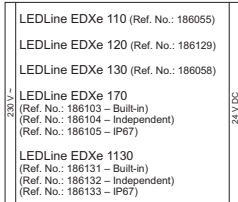


c) System performance can be extended beyond 120 W using slave boards to feed in additional power.

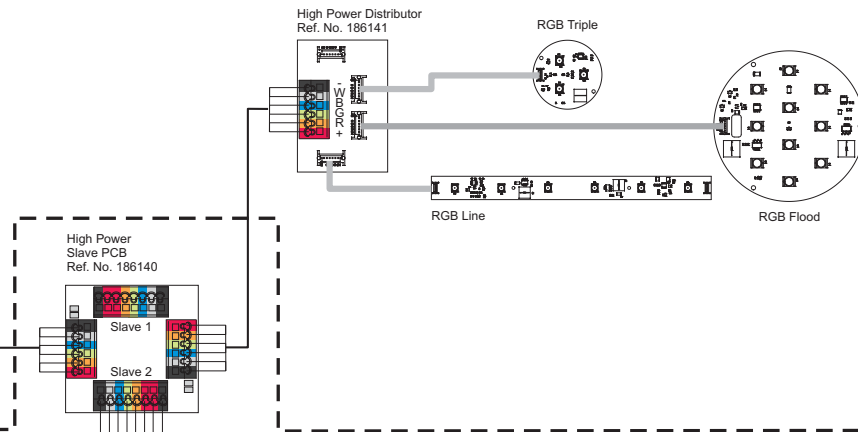
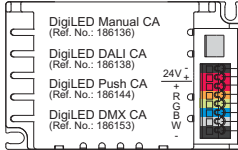
Functional descriptions and terminal connections for slave boards can be found in the respective data sheets at www.vs-optoelectronic.com.

Voltage Supply by first Converter

Converter LEDLine EDX

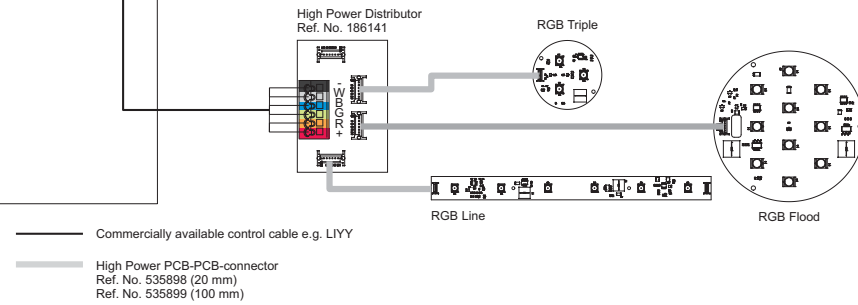
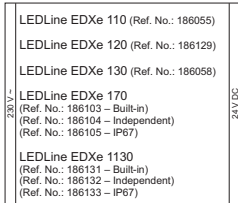


DigiLED colour control



System Expansion by High Power Slave PCB and additional Converter

Converter LEDLine EDX



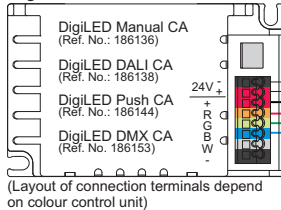
5.2.2 Connection of LowPower 24 V Assembly Modules

LowPower 24 V RGB CA LED assembly modules with four connection elements (+RGB) can be directly connected to DigiLED DMX CA via poles 3 (+), 4 (red channel), 5 (green channel) and 6 (blue channel) under observation of the permissible power rating. Compliance with the colour coding (polarity) detailed in table 4.2 must be ensured.

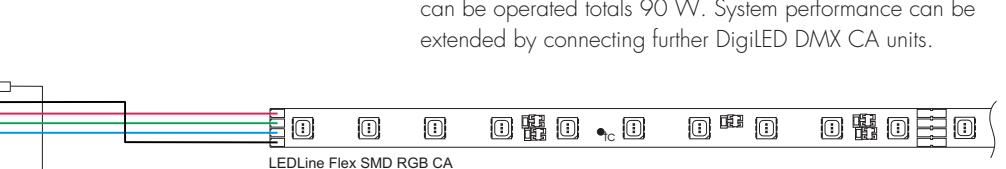
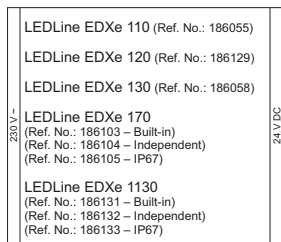
The maximum number of connected LowPower LED assembly modules is limited by the power rating of the connected converter and the maximum current load of pole 4, 5 and 6 (sum: 90 W) in accordance with table 4.2. The power and current draw values of the connected LED assembly modules can be found at www.vs-optoelectronic.com.

The maximum power rating with which a DigiLED DMX CA unit can be operated totals 90 W. System performance can be extended by connecting further DigiLED DMX CA units.

DigiLED colour control



Converter LEDLine EDX



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6 Notes on Installation and Safe Operation

6.1 Installation

Installation must be carried out under observation of the relevant regulations and standards. The components of the 24 V CA system are designed for operation within a casing or luminaire. Installation must be carried out in a voltage-free state (i.e. disconnection from the mains). The following advice must be observed; non-observance can result in the destruction of the components, fire and/or other hazards:

- DigiLED DMX CA is exclusively designed for operating 24 V Common Anode LED modules.
- The load range of the connected 24 V converter must be observed.
- The maximum output currents specified in table 4.2 must not be exceeded.
- The temperature measured at the t_c point must not exceed the specified limit ($t_{cmax.} = 60^\circ\text{C}$) during operation.

6.2 Assembly

- Installation any way up
- Installation only in dry rooms or luminaires, box casings or similar. If DigiLED DMX CA is to be installed outdoors or in a damp location, a casing of a suitable protection class (IP) must be used.
- Attach using 4 mm screws
- Ensure solid and even surface for unit to rest on

7 Standards

7.1 Applied Standards

EN 61347-1
Lamp controlgear – Part 1: General requirements and tests (IEC 61347-1:2000);
German Version EN 61347-1:2001
EN 61347-2-11
Lamp controlgear – Part 2-11: Particular requirements for miscellaneous electronic circuits used with luminaires (IEC 61347-2-11:2001);
German Version EN 61347-2-11:2001
EN 55015
Limits and methods of measurement of radio disturbance characteristics of electrical lighting and similar equipment

7.2 Standards to adhere

EN 61347-2-13
Lamp controlgear – Part 2-13: Particular requirements for D.C. or A.C. supplied electronic controlgear for LED modules
EN 62384
D.C. or A.C. supplied electronic control gear for LED modules – Performance requirements