4ch Mini I LEDdriver

350mA or 700mA

DMX-RDM

Ordercode: 10235

CONTENT

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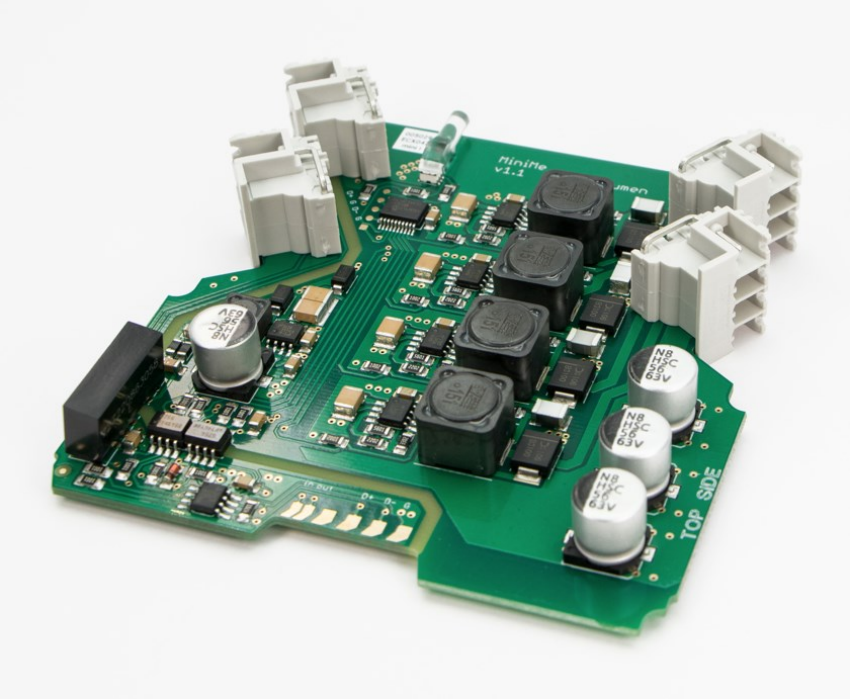
1 Picture

1.1 Housing with Information tag

1.2 PCB (inside of LEDdriver)



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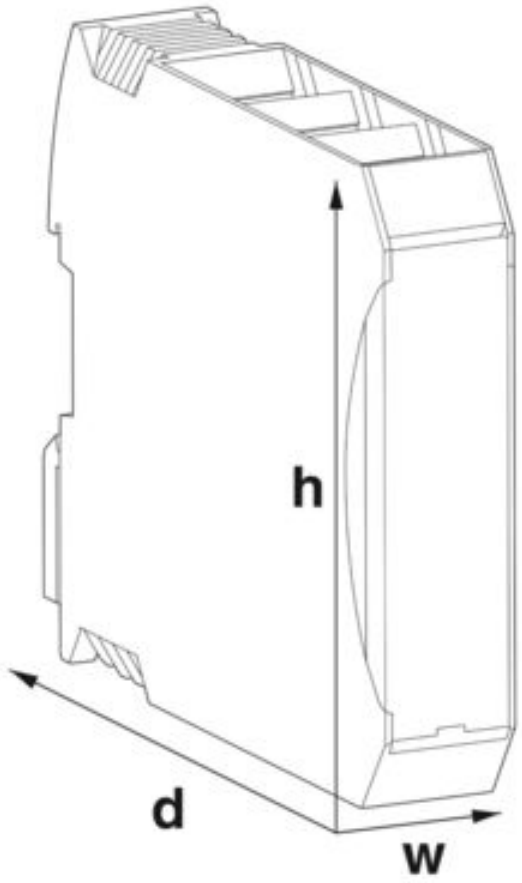
2 Dimensions



Width:	22,6mm
Height:	99mm
Depth	133,65mm
Depth from top edge op DIN rail	107mm

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3 Safety information

Before installing, powering up, or servicing this LED driver card, it is highly recommended that you read this manual and ensure yourself that you completely understand its content. Observe the safety precautions in this manual. Install and operate the led driver only as described in this manual, and in conformity with local regulations. If you have any questions how to operate this product safely, please contact your point of sale.

3.1 Symbols

Following symbols are used to identify important safety information on the product and in this manual.

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3.2 Protection from electric shock

Although this card itself does not operate with dangerous voltages, the installation in which is intended to be used, can contain dangerous voltages. Shut down the power of the complete installation before carrying out any installation, or maintenance work.

Please note that all metal parts used in the enclosure, where this card is mounted are firmly grounded.

Use only AC to DC power sources, suitable for the application and conform to local regulations. Please ensure yourself that the AC to DC power supply is able to deliver the rated current requirements of the installation.

If any cable, seal or housing is damaged, cracked or reformed, disconnect the power of the installation immediately.

The LED driver card is only to be used in a proper housing conform to local regulations.

For any additional servicing, not described in this manual, please contact your point of sale.

3.3 Protections from fire and burns

Do not operate this LED driver card if ambient temperatures, inside its enclosure, is above 45 °C (113 °F). Please ensure yourself that sufficient ventilation around the card is possible.

It might be necessary to allow the LED driver card to cool down for 5 minutes, before servicing.

Do not modify the card, in a way, not described in this manual.

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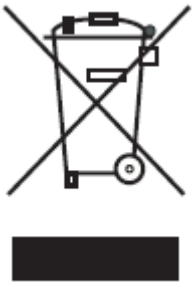
3.4 Protection from injury

Ensure yourself that all components, covers are securely fastened. Verify that the card is firmly clicked on a standard din-rail.

3.5 Disposing of this product



This LED driver card is manufactured in compliance with directive of the European community: waste electrical and electronically equipment. Please help to preserve our environment and ensure that this product will be recycled properly at the end of its life.

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Physical installation

Thank you for selecting this LED driver card as best solution in your setup.

Warning! Read the safety precautions in this manual before integrating this card into your installation.

Installation must be carried out by qualified professionals only.

Assure yourself that there is sufficient and unrestricted air flow around the LED driver card.

4.1 Unpacking

The following items are included in your package:

- Led driver-card
- Carton box package
- Short form manual

4.2 Location and orientation

This LED driver card cannot be used without additional protective housing. The housing protects the user against electrical shocks, and it is protecting the card against climatologically influences.

Please assure yourself that the cabinet, which houses the LED driver card is according to local regulations and laws of the country of installation.

It is advised to install the card in horizontal position on the din-rail.

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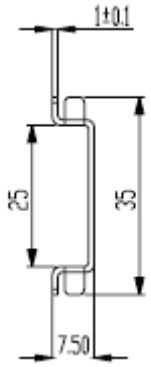
4.3 Mounting

The LED driver can be mounted on a standard 35 mm top hat din-rail. A typical section of this din rail can be found here:



Note: Use end blocking clamps if necessary, in your application.

The Mini I housing is provided with a din-rail clip. By pulling this metal clip the driver can be set and released from the din-rail. The LED driver card is designed for architectural purposes in fixed installation.

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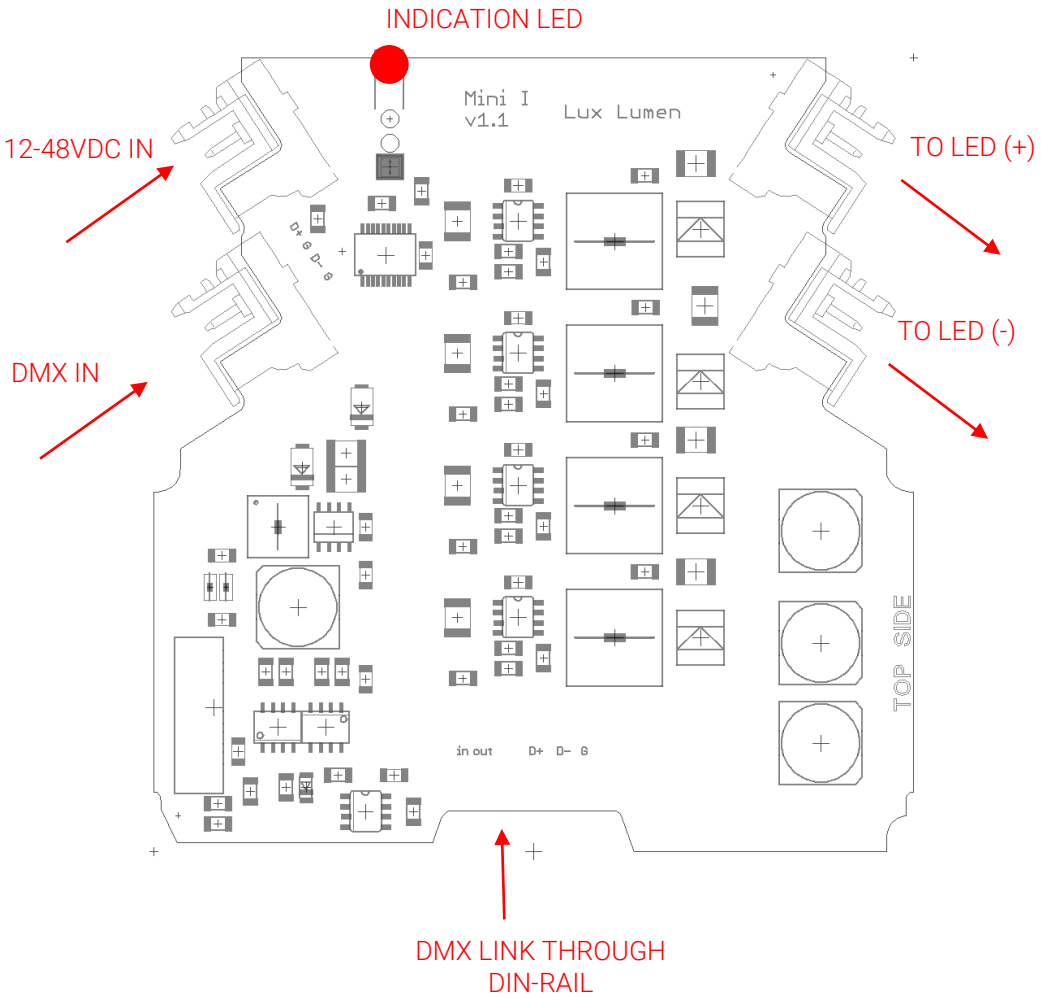
External connections

5.1 General



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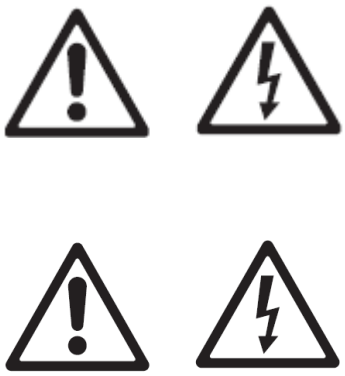
5.2 DC power input



Safety precautions

Never connect the live power on the input terminals of the LED driver card! In case of doubts, contact your point of sale.

Polarity

Please observe the polarity at the power supply input terminals. Improper connection might damage the card, and power supply permanently. In case of inversed polarity, warranty is void.

The correct polarity can be found on the label applied on the front of the 4ch Mini I LEDdriver.

Power input (from left to right)	Polarity symbol	Name of polarity
1	-	Negative
2	-	Negative
3	+	Positive
4	+	Positive

Front view:

Top view

Note: In the correct orientation the text is readable on label.

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Physical connections

The card itself is operating into the range 12 volt tot 48 volt DC.

A PCB connector is used to connect the conductors to the 4ch Mini I LEDdriver.

The cable section of the power feeding cable must be in the range like given in the table below:

CONDUCTOR CONNECTION	
Connection method	Push-in spring connection
Conductor cross section rigid	0.2-2.5 mm²
Conductor cross section flexible	0.2-2.5 mm²
Conductor cross section AWG	24-14
Stripping length	10mm
Conductor entry angle	0° to PCB

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Requirements power supply: Rated voltage

As a rule of thumb, the voltage range of the input of the power supply is situated in the range:

Voltage input in volt	Quantity of led's
12	1
12	2
12	3
24	4
24	5
24	6
48	7
48	8
48	9
48	10
48	11
48	12
48	13
48	14
48	15

If different colours or quantities of leds are used at one LED driver card, the highest voltage input is applicable.

Please note that you can calculate the power supply input, by following formula:

- $U_s = (U_f \times Qty) + 2\ (volt)$

Abbreviations and units used in this equation are listed below:

abbrevition	full name	description	unit
U_s	$U_{powersupply}$	The minimum required voltage of the power supply, driving the LED driver card	Volt
U_f	$U_{forward}$	The forward voltage or the actual leds used in your setup. Please refer to the manufactor	Volt
Qty	Quantity	Number of leds connected in series to one output.	Number

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Required power supply: current power

The AC/DC power supply has to be able to drive sufficient power required in your setup.

- $P_s = (P_l \times Qty) + 10$ *(watt)*

Abbreviations and units used in this equation are listed below:

abbrevition	full name	description	unit
P_s	powersupply	The minimum required power of the power supply, driving the LED driver card	Watt
Qty	Quantity	Number of leds connected in series to one output.	Number
P_l	P led	Power of the LED	Watt

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5.3 DC power outputs

Safety precautions

Never connect the live power on the output terminals of the LED driver card!

Never connect other devices as the correct type of leds to the outputs of the LED driver card.

In case of doubts, contact your point of sale.

Polarity

Please observe the polarity at the LED driver output terminals. Improper connection might damage the card, and leds permanently. In case of inversed polarity, warranty is void.

The positive polarisation is the common line in the led-string in case of use as RGBW modules in a 5-wire system.

The correct polarity can be found on the label applied on the front of the 4ch Mini I LEDdriver.

Power output front row from left to right	symbol	Meaning
1	+	+350mA or +700mA
2	+	+350mA or +700mA
3	+	+350mA or +700mA
4	+	+350mA or +700mA

Power output back row from left to right	symbol	Meaning
1	R	Red
2	G	Green
3	B	Blue
4	W	White

The output current depends on the type of 4ch Mini I LEDdriver: 350mA or 700mA.

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Front view:

Bottom view:

Note: In the correct orientation the text is readable on the label.

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Physical connections

A PCB connector is used to connect the conductors to the 4ch Mini I LEDdriver.

The cable section of the power feeding cable must be in the range like given in the table below:

CONDUCTOR CONNECTION	
Connection method	Push-in spring connection
Conductor cross section rigid	0.2-2.5 mm²
Conductor cross section flexible	0.2-2.5 mm²
Conductor cross section AWG	24-14
Stripping length	10mm
Conductor entry angle	0° to PCB

Cable length / min sections from LED driver to led string

The minimal section of the cable is given by following table:

Cable function	Max current	Min section
Red	700 mA	0.25 mm²
Green	700 mA	0.25 mm²
Blue	700 mA	0.25 mm²
White	700 mA	0.25 mm²
Common	2800 mA	0.25 mm²

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5.4 DMX-RDM input

Precautions

Never connect other devices as a DMX transmitter or receiver to this input and output.

In case of doubts, please contact your point of sale.

Specifications

The use of Cat.5 or Cat.6 cable is conformal the DMX 2004 by USITT in fixed installations. For more detailed information: www.usitt.org

The benefits are:

- Low cost of connectors
- Low cost of cabling
- Worldwide availability
- Fast application on site
- Very well known by electrical contractors
- Reliable connections

When the DMX-signal should be corrupt or not present, the card will fall back to captured preset value after 2 seconds. Default capture is 0%. To capture a preset value, send the same value in DMX for at least 2 seconds to the device and in RDM send a capture command.

Suitable cable for transmission of the DMX-signal

Name of cable	Shielded or not shielded	Remarks regarding shielding	Max run length	Termination above run length (see 7.1)
CAT 5E UTP	Not	No ground connection at output terminals	250 m	100 m
CAT 5E FTP or STP	Yes	Connection of shielding to PE clamp of output terminals	250 m	100 m
CAT 6 UTP	Not	No ground connection at output terminals	250 m	100 m
CAT 6 FTP or STP	Yes	Connection of shielding to PE clamp of output terminals	250 m	100 m

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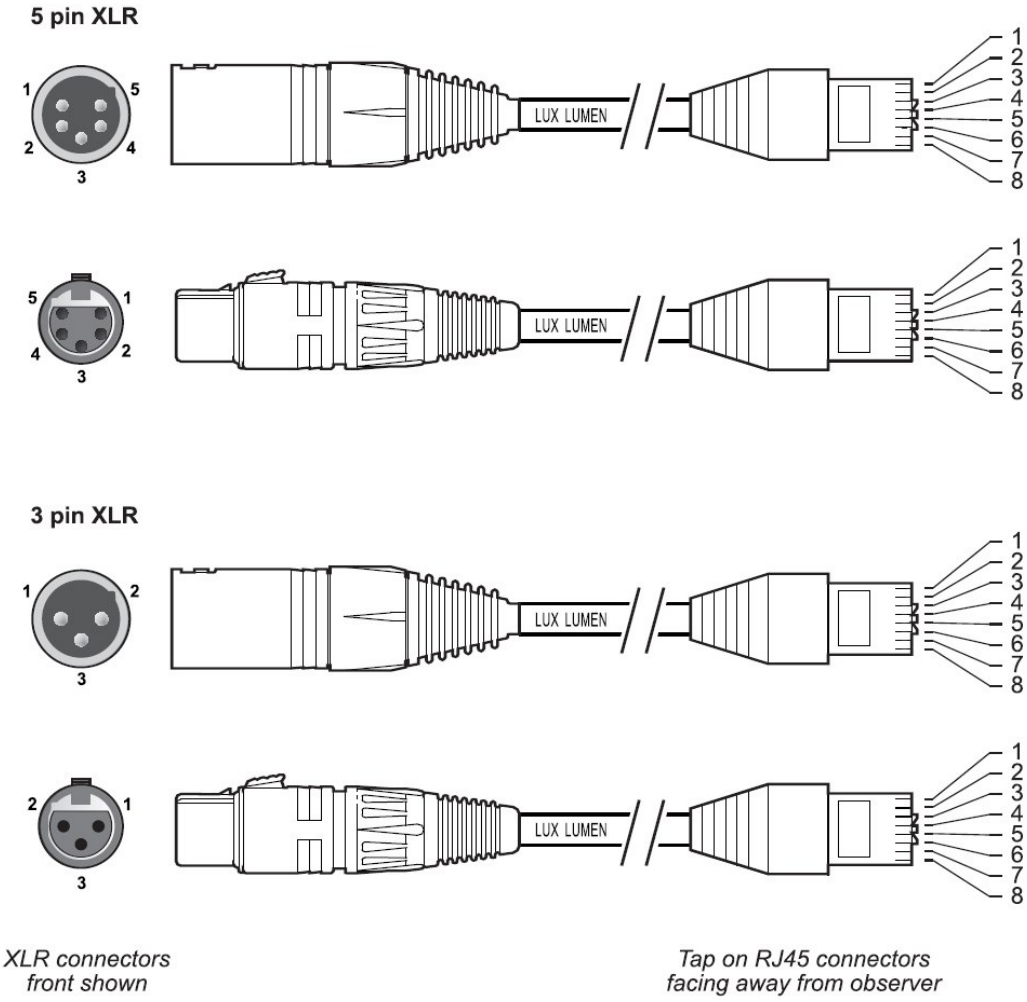
Pin layout of UTP to XLR connectors

XLR pin 1 wired to UTP contacts 7 and 8. UTP wire color usually brown and brown/white for shielding.

XLR pin 2 wired to UTP contact 2. UTP wire color usually orange for data negative connection.

XLR pin 3 wired to UTP contact 1. UTP wire color usually orange/white for data positive connection.



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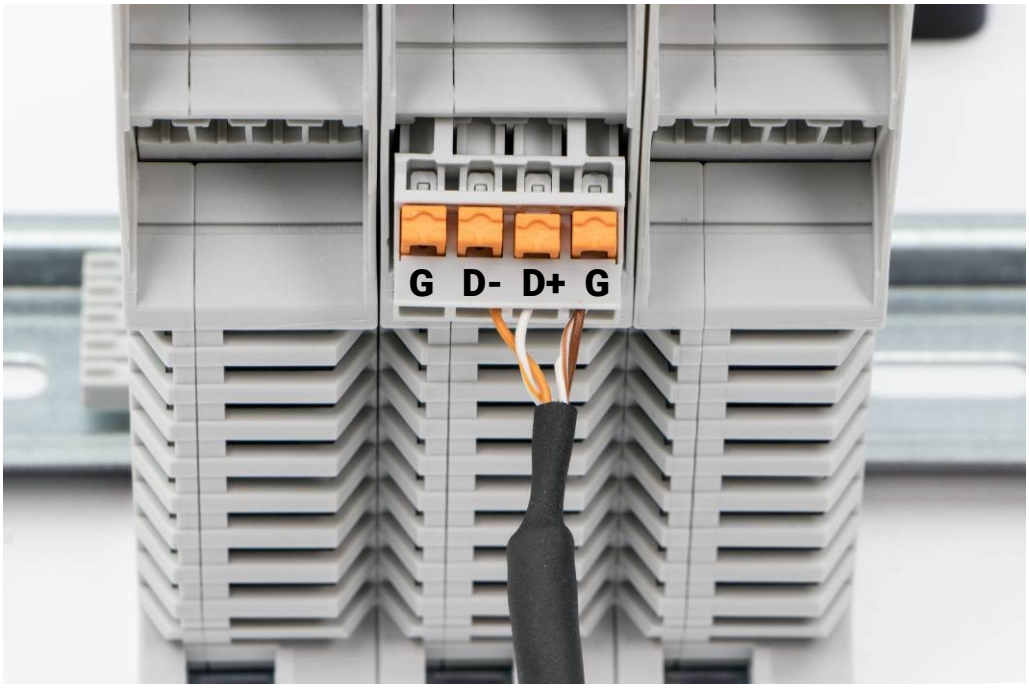
UTP wiring connection in clamps

Connect the brown/white brown wire of the UTP cable to one of the the ground clamps, like indicated on the 4ch Mini I LEDdriver.

Connect the white wire to the DMX+ clamp.

And connect the orange wire to the DMX- clamp.



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DMX-RDM linking through din-rail connector

A din-rail connector is available for the 4ch Mini I LEDdriver. This connector links the DMX-RDM signal with an adjacent driver.

The connector can be pre-mounted on the din-rail before mounting the drivers.

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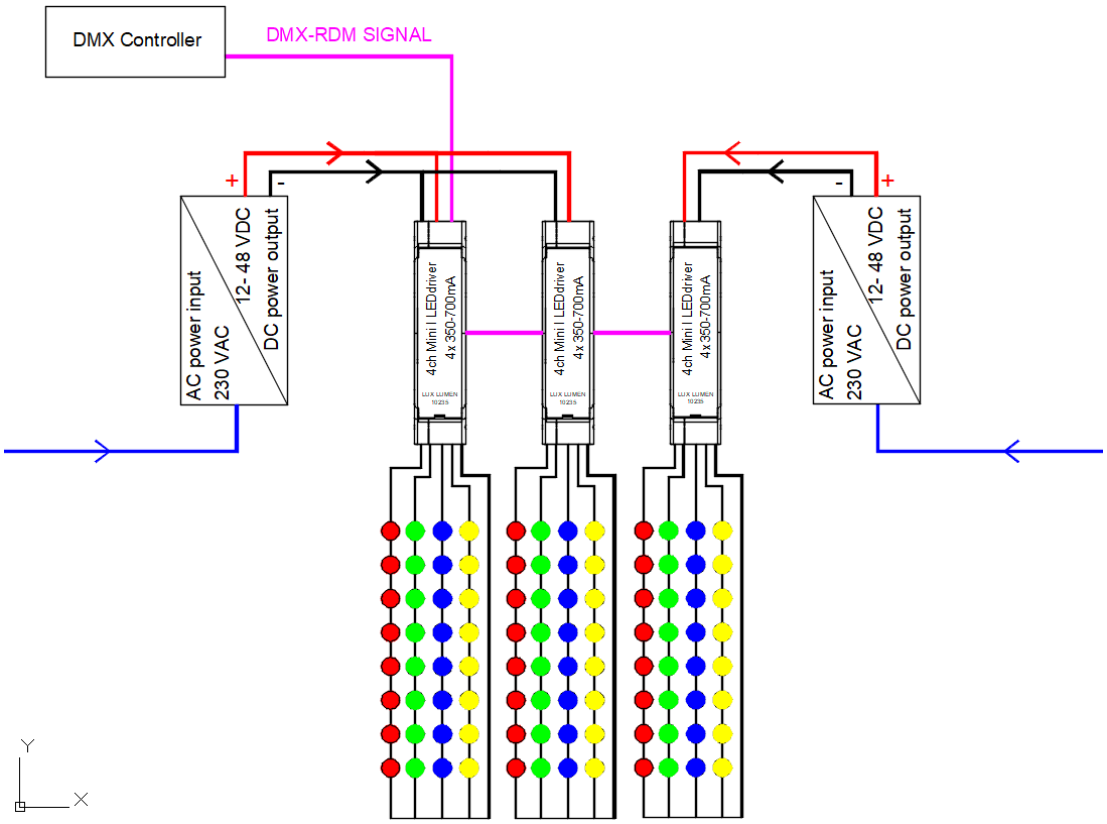

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6 EMC and safety requirements

The LED driver card is fully compliant to the LVD and EMC directive of the European council, if used in a properly designed setup.

EMC requirements of the power supply:

The LED driver card is only intended to be used in lighting applications, and as such, the complete assembly of led unit and power supply needs to be fully compliant with the harmonized standards.

Immunity according to:

- EN 61547:2009 (General EMC immunity requirements lighting eq.)
- EN 61000-4-1:2006 (General immunity testing techniques)
- EN 61000-4-2:2008 (ESD immunity test)
- EN 61000-4-3:2006 + A1:2007 (Radiated immunity test)
- EN 61000-4-4:2004 (Fast transients and burst immunity)
- EN 61000-4-5:2005 (Surge immunity test)
- EN 61000-4-6:2008 (Conducted immunity test)
- EN 61000-4-8:1993 (Magnetic field immunity test)
- EN 61000-4-11:2004 (Voltage variations immunity test)
- EN 61000-6-1:2005 (Generic standards for immunity)

Emission according to:

- EN 61000-3-2:2005+A1:2008+A2:2009 (Harmonics emission test<16A)
- EN 61000-3-3:2008 (Flicker+ voltage changes limits< 16A)
- EN 55015:2006+A2:2009 (Conducted + radiated emission lighting equipment)

To achieve this compliance, a proper power supply must be supplied. In case of doubts, contact your point of sale.

LVD requirements of the power supply:

The LED driver card is only intended to be used in lighting applications, and as such, the complete assembly of led unit and power supply needs to be fully compliant with following harmonized standards:

- EN 60598: general requirements of lighting equipment.

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Installation setup

7.1 General description

The LED driver card is intended to control high power led-modules at 350-700mA by a DMX-RDM signal.

At the outputs a set of high power leds (in one serial string per output) is connected.

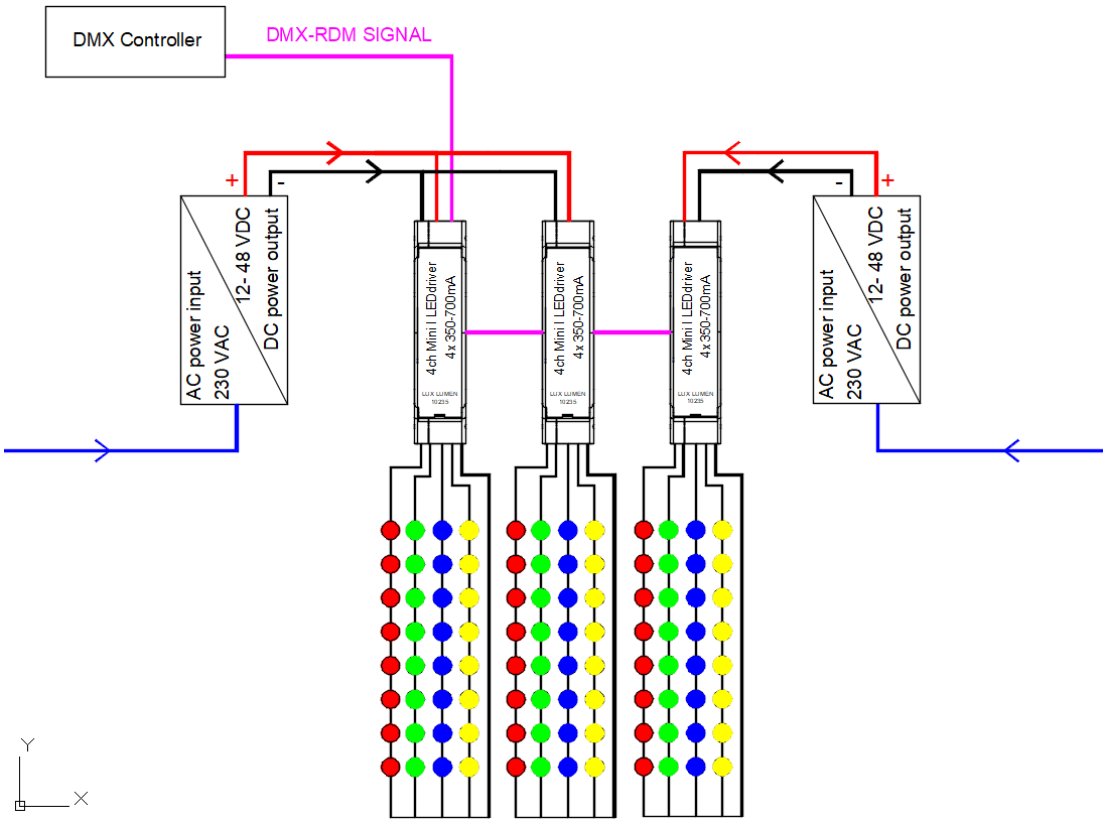
An external power supply AC/DC will provide the card with the required power.

A DMX-RDM controller controls the intensity of the various output channels.

The DMX-RDM signal can be wired through the connectors on top of the driver, as well as linked between multiple drivers through the DIN-rail connector. Resulting in an easy installation without excessive cabling.

7.2 Typical layout

The drawing given here shows a typical layout when used with high-power RGBW led-modules. Although the application is given for RGBW, the outputs might drive mono-chrome leds of one colour as well.



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Card configuration

8.1 DMX-RDM start address setting

The driver can be set in multiple DMX personalities:

Mini I/U (v2.3)					
pers	Personality name	OUT R	OUT G	OUT B	OUT W
1	single channel (1ch)	DMX 1	DMX 1	DMX 1	DMX 1
2	tunable white WC (2ch)	DMX 1	DMX 2	DMX 1	DMX 2
3	tunable white CW (2ch)	DMX 2	DMX 1	DMX 2	DMX 1
4	RGB (3ch)	DMX 1	DMX 2	DMX 3	-
5	RGBW (4ch)	DMX 1	DMX 2	DMX 3	DMX 4
6	WRGB (4ch)	DMX 2	DMX 3	DMX 4	DMX 1

When the card is set in 4ch mode, it will use 4 consecutive DMX channels. For example, if the start address is set to 009 and the mode of the card is the addresses of the different led-outputs will be as the table below:

DMX address	Driver card output
009 (address set via RDM)	Led output nr 1
010	Led output nr 2
011	Led output nr 3
012	Led output nr 4

The 4ch Mini I LEDdriver is RDM addressable. The DMX address can be set with the help of any RDM capable device. For example the DMXcat hardware and the DMXcat software (free app download) can be used.

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8.2 Safety precautions

Read carefully the safety information in this manual. Lock out the power on the entire system and allow all electronic devices to discharge, and cool down, before executing any service or maintenance.

8.3 Cleaning

LED driver card itself

Extensive dirt and particle build-up degrade performance and may cause overheating. This can result in damaged board and power supplies. Damage by inadequate cleaning or maintenance is not covered by the product warranty.

Never use solvents to clean the outer housing of the card.

Never use water or wet cloth.

Enclosure, in which the card is integrated

Best is to use compressed air to remove dust, or soft cloth to remove the dust in the cabinet. When using compressed air, care must be taken not to damage the fans in the enclosure. Never use solvents to clean the outer housing of the enclosure.

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8.4 *Monitoring*

The LED driver is equipped with a RGB LED to indicate its current status. The color and behavior of the LED provide specific information about the driver's operational state and signal reception.

Red Light	The driver is powered on and operational.
Green Light	The driver is receiving a DMX signal.
RGBW Flash	The driver is in RDM identification mode

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9 Specifications

9.1 *Electrical*

Inputs

- 12 to 48 volt
- 1,2 to 130 watt power consumption depending on configuration of your complete setup.
- Power input on Phoenix contact connector. (link)
- DMX input on Phoenix contact connector. (link)
- DMX link between
- DMX start address settable with DMX-RDM
- Status led for DMX and power input

Outputs

- 4 independent controllable outputs
- Each output capable of driving 350mA-700mA load over a voltage of maximum 48 volt DC in PWM dimming mode.
- Outputs in RGBW mode, on Phoenix contact connector. (link).
  However not only RGBW leds can be connected to the driver. Also monochrome or tunable white leds may be connected. Through RDM one can set the personality of the driver in the adapted mode (see 8.1)

9.2 *Environmental*

- IP rating: IP 20
- Humidity: 30% to 95%
- Ta (max): +40 °C (104 °F)
- Ta (min): -15 ° C (+5 °F)
- Tc (max): +55 °C (131 °F)

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9.3 Mechanical

Physical dimensions of the card below:

Dimensions LED driver card	W 22,6 x H 99 x D 113,7	mm
Weight LED driver card	145	gr
Material of housing	Polyamide	
Color of housing	Light gray RAL 7035	

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Warranty

Application of warranty

Warranty period

Warranty service is valid for one year from the date of purchase by the consumer, as evidenced by invoice date given out by your point of sale.

Warranty service

Service under warranty can only be done by Lux Lumen.

Coördinaties:

Lux Lumen
Kernenergiestraat 53 A
2610 Wilrijk
Belgium

Any cost of secure transportation of the product to and from Lux Lumen service department, will be borne by the customer.

Limitations

Lux Lumen will not warrant the following:

- Periodic check-ups, maintenance and repair or replacement of parts due to normal wear and tear.
- Consumables
- Any software
- Defects caused by modifications carried out without Lux Lumen's approval.
- Damage resulting from the fact that a product is not conforming to country specific standards or specifications in another country that the country of purchase.

Costs incurred by Lux Lumen's service center in making any adoptions or modifications of a product necessary for country specific technical or safety standards or specifications, or any other cost to adjust the product as a result of any specifications which have changed since the delivery of the product.

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Warranty service is excluded if damage or defects have been caused by:

Improper use, extensive use, handling or operation of the product as referred to in the user manual or operator manual and/or relevant user documents, including without limitation, incorrect storage, dropping, excessive shocks, corrosions, dirt, water, or sand damage, if the product is not rated to be used in severe conditions, indicated by its IP and IK degree, mentioned in the product specifications in this manual.

Repairs, modifications or cleaning carried out by a non Lux Lumen service centre.

Use of spare parts, software or consumables, which are not compatible with the product.

Connecting the product to equipment not intended to be used with this product.

Defects caused by improper condition of the power supply network.

Inadequate packaging of the product when returning it under the RMA procedure.

Accidents or disasters or any cause beyond the control of Lux Lumen, including but not limited to lightning, water, fire, public disturbances, improper ventilation, and acts of god.

Others

It is the responsibility of the customer to backup and save any software files and programs before repair and to restore the same after such repair.

This warranty does not affect the consumer's statutory rights under applicable national legislation in force, nor the consumer's rights against the retailer arising from the sales/purchase contract. In the absence of applicable national legislation, this warranty will be the consumer's sole and exclusive remedy, and Lux Lumen cannot be liable for any incidental or consequential damages for breach of any express or implied warranty of this product.

For full details of the warranty offered on this product, please contact Lux Lumen's service center.

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10.1 RMA procedure

To send material back to Lux Lumen, you need a RMA (Return Material Authorization) document that you will receive from Lux Lumen.

Without the RMA document, we cannot accept the material.

The procedure to obtain a RMA:

Step 1:

Customer contacts Lux Lumen about warranty, defects if material has to be returned.

Step 2:

Lux Lumen sends the customer a filled out RMA document (using a unique RMA number)

Step 3:

Customer sends material (include a copy of the RMA document with the material)

Step 4:

Lux Lumen evaluates the problem, and informs the client if repair is done under warranty or makes an offer to the client for repair.

Step 5:

The procedure related to lux lumen quality procedures, according ISO 9001 is started up.

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Used list of abbreviations

- DMX: digital multiplexed data signal to according to USITT
- PCB: printed circuit board
- PWM: Pulse width modulation
- CAT 5: category 5 cable
- CAT 6: category 6 cable
- U_f: Forward voltage of the LED junction
- AC: Alternating current
- DC: Direct current
- °F: Temperature in degrees Fahrenheit
- °C: Temperature in degrees Celsius
- Din-rail: rail used in electrical installation, according to 'Deutsche Industry Norm' specifications
- LED: Light Emitting Diode
- RDM: Remote Device Management

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