ZENOPIX
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*Your Solution Partner in Lighting Control*

# DMX & RDM CONSTANT CURRENT ROUND DECODER

**USER MANUAL**



**Version 3 / October 2026**

zenopix.com



Thank you for choosing the Zenopix DMX & RDM Constant Current Round Decoder. Please read this booklet and the product user manual before using the product. The user manual is available on our website. If you experience any technical problem, you can contact our company using the information below and receive technical support.

**Company Information and Contact Address**

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## Safe Use

Use the device only in dry environments (indoors). The device is an unenclosed PCB with no IP rating. Do not use the device in humid environments and avoid contact with water or other liquids. Switch off the power if you will not use the device for a long time. The use of galvanic isolation is always recommended. Do not remove any part from the unit. Do not connect the unit to an ungrounded circuit. Do not connect the unit to LEDs that are switched on. Connect the unit only to LEDs and controllers that are initially switched off. There are no user-serviceable parts inside or outside the device. Repair service is the sole responsibility of the manufacturer. If the device appears to be defective, please contact your dealer. After the warranty period has expired, you can contact your supplier or the manufacturer about having the unit repaired, if possible, for a service fee. This device must be used by professionals. The device is not designed to be operated by non-professionals or children.

## Warranty Information

The Zenopix DMX & RDM Constant Current Round Decoder comes with a 2-year manufacturer's warranty, extendable to 5 years with an optional 3-year extension. Detailed information is available in the product warranty certificate or on our website.

## Box Contents

1× Zenopix DMX & RDM Constant Current Round Decoder

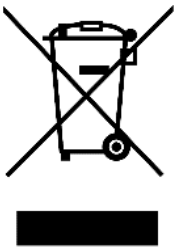
1× Device Test Report

2× Female Terminal Blocks (only included with PTB-coded products)

**NOTE:** After opening the package, check its contents and inspect the device for damage! If anything is missing or damaged, contact your supplier. Do not use the device if it appears damaged!

## Information on Human and Environmental Health

If the information in the User Manual is fully followed, this device poses no risk to human health or the environment. The device must not be disposed of with household waste; it must be delivered to an electrical and electronic equipment recycling center. It must be recycled or disposed of without harming nature or human health.



## Introduction

The ZENOPIX DMX & RDM Constant Current Round Decoder is a professional LED driver that processes standard DMX512 signals and supplies constant current to high-power LEDs. Thanks to integrated RDM (Remote Device Management) support, it communicates bidirectionally with the main control unit, allowing device parameters to be easily configured and monitored remotely. Over a wide 12–48VDC operating voltage range, it provides flicker-free, smooth dimming over the 0%–100% range for outstanding performance in architectural and stage lighting applications, while its built-in gamma correction allows precise adjustment of brightness curves.

In addition to a soft-start feature that limits inrush current at power-up, the device is equipped with under-voltage lockout (UVLO), over-temperature (OTP) and output over-current (OOCP) protection to prevent damage to the system and LEDs.

## Features

- Operating voltage up to 48V.
- Flicker-free thanks to high-frequency switching.
- RDM support.
- Easy installation.
- Built-in gamma correction.

## Application Areas

- Stage Lighting
- Architectural Lighting Applications
- High-Power LED Wall-Washer Fixtures
- Parallel Lighting Systems with Common Anode Connection
- Professional LED Driving and Control Projects

## Safety Instructions

To prevent misuse of the device, damage or personal injury, please follow the instructions below:

| | |
|---|---|
| ⚠️ | This device operates at low voltage (DC 12-48V). Do not use lower or higher voltages. Do not apply reverse-polarity voltage to the device. |
| ⚠️ | Any external power supply to be connected must be fused according to its output power and/or protected against short circuits. |
| ⚠️ | It is the user's responsibility to protect the device against lightning, electric shock and high-voltage surges. Make sure that all necessary electrical surge protection measures have been taken at the installation site. |
| ⚠️ | In high-current applications, cable cross-sections and connectors must be selected according to the maximum current drawn by the device to prevent line losses and heating. Improperly sized cables and connectors can overheat, cause voltage drop and increase the risk of a short circuit, creating a fire hazard. The user is solely responsible for correct sizing. |

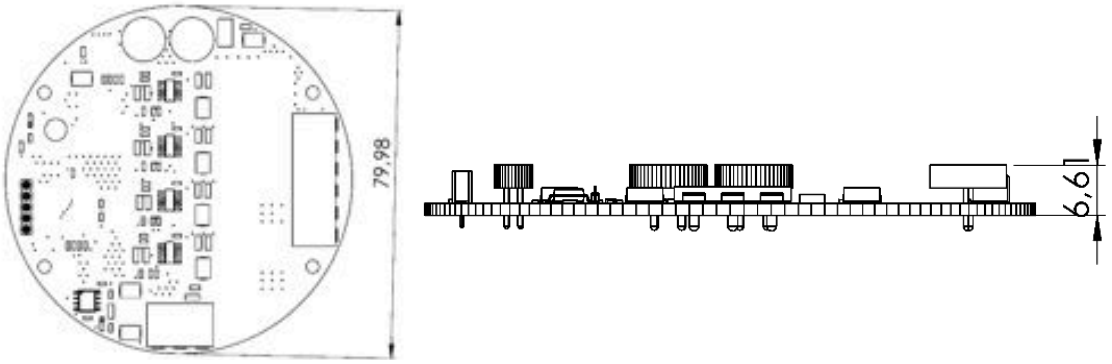
## Technical Specifications

| | |
|---|---|
| **Dimming Interface** | DMX512/RDM |
| **Input voltage range** | 12-48VDC |
| **Input voltage (Abs. Max.)** | 50V DC |
| **Output voltage range** | 0V- Vin |
| **No-load power** | <1W |
| **Firmware update** | Updated over RDM with the Zenopix Explorer software. |
| **Drive Method** | Common Anode (LED + terminals common) |
| **Output current options** *[1] | Factory-set, 150mA to 1400mA. |
| **Current hysteresis window** $\Delta I_{HYS}$ | ±%5 |
| **Max. cont. output power (4CH)** | ~201.6W (@4CH/48V 1050mA, 100% DIM)<br>~134.4W (@4CH/24V 1400mA, 100% DIM) |
| **Dimming Range** | 0~100% (0.4% resolution via DMX signal) |
| **Dimming method** | PWM |
| **PWM switching frequency** | 500 kHz |
| **Efficiency** | >90% efficiency<br>(Test: 36V, 700mA, 9 LEDs in series) |
| **Dimensions Diameter / Height** | Diameter: 79.98mm, Height: 6.61mm |
| **Weight** | 52g |
| **Operating temp./humidity** | -10°C, +70°C / 20 ~ 70%RH, non-condensing |
| **Storage temp./humidity** | -20°C ~ 80°C, 0~ 80% RH, Non-Condensing |
| **Certificates** | CE, RoHS |

***1:** The current value can be set according to the wattage requested by the user. Please do not hesitate to contact us for your special current requirements.*

**Recommendation:** You can choose a DC power supply that meets your current and voltage requirements. A power supply with short-circuit protection is recommended. For example, Mean Well LRS-350-24 can be used.

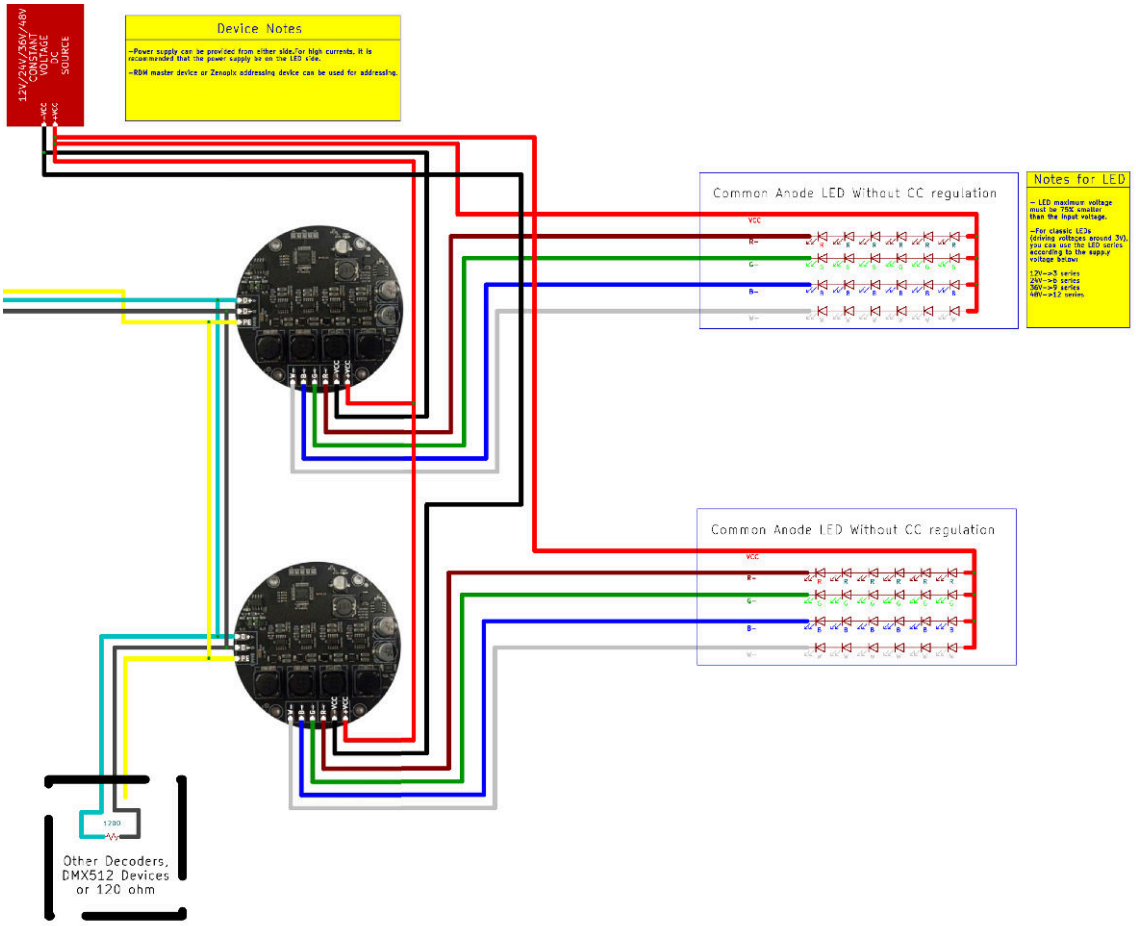
## Device Dimensions

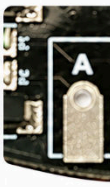



**The product image may vary depending on the production series and variant. See the order code section for details.*

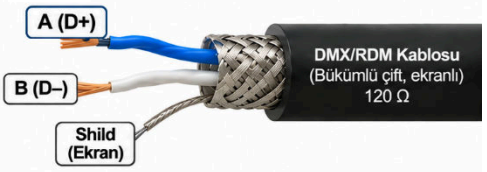


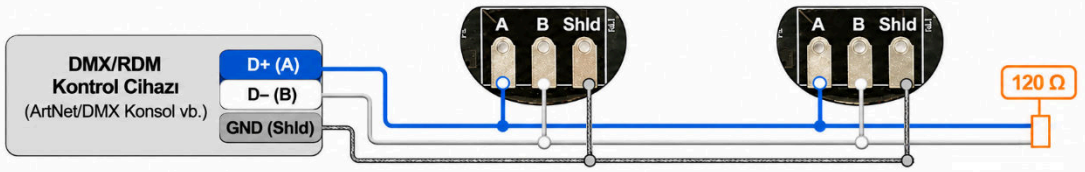
## Pin Connections




| Pin | DMX/RDM (RS-485) | Açıklama |
|---|---|---|
| A | D+ (Data +) | Pozitif (+) hat |
| B | D– (Data –) | Negatif (–) hat |
| Shld | Shield (GND) | Kablo ekranı (şase/toprak) |

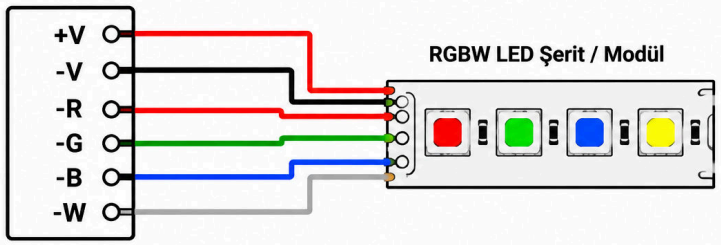



- Bağlantı eşleştirmesi (PCB'ye uygun): **A** = D+ (Data +), **B** = D– (Data –), **Shld** = ekran.
- DMX/RDM (RS-485) için 120 Ω empedanslı, bükümlü çift, ekranlı kablo kullanın.
- Hat topolojisi: tek hat (daisy-chain). Yıldız (star) bağlantıdan kaçının.
- Hat sonunda **D+ (A)** ile **D– (B)** arasına 120 Ω terminasyon direnci bağlayın.




| Pin | Adı | Açıklama |
|---|---|---|
| +V | V+ | Besleme pozitif (+) (genelde 12 VDC veya 24 VDC) |
| -V | V– | Besleme negatif (0 V, GND) |
| -R | R– | Kırmızı kanal (sabit akım negatif çıkışı) |
| -G | G– | Yeşil kanal (sabit akım negatif çıkışı) |
| -B | B– | Mavi kanal (sabit akım negatif çıkışı) |
| -W | W– | Beyaz kanal (sabit akım negatif çıkışı) |




**Not:** Çıkışlar "negatif anahtarlamalı" (common anode) yapıdadır.
LED'in ortak anodu +V'ye, her renk kanalı ise (-R, -G, -B, -W) pinlerine bağlanır.

- When wiring the device, select a suitable cable type and cross-section, and use cables and connectors rated for the required current.
- A data cable impedance of 120 Ω is recommended. Half-duplex RS485 or DMX cable is recommended.
- If your LED current is >6A, joining the +(Anode) terminals at the terminal blocks or solder pads on the device is not recommended. At high currents, it is better to distribute the +(Anode) terminals of the LEDs from the power supply in a star topology.
- The product has power inputs on both sides and can carry current through the product provided the total current is <6A. However, carrying power through the product is not recommended. In applications where the total current exceeds 6A, distribute the + (Anode) terminals of the LEDs from the power supply in a star topology.
- Please make sure your LEDs support common anode (+ terminals can be shared, -(cathode) terminals are independent).
- A 120 Ω termination resistor at the end of the DMX line is strongly recommended.

- Wiring must be performed by qualified personnel.
- Avoid reverse polarity during connection.

When making the RDM/DMX connection, connect the devices in a daisy-chain structure (so that the DMX output of one device is connected to the DMX input of the next device). Never use a Star topology on the DMX line. Make the cable connections between terminals bearing the same name label. It is recommended to use cables specifically manufactured for RS485 ***1.** Do not route RDM/DMX signal lines near power lines carrying high voltage or high current (for example, asynchronous motor supply cables). For reliable signal transmission, connect a 120 Ω termination resistor to the DMX OUT port of the last device.

****1 Recommendation:*** *Recommended Belden cables for DMX are listed below. Make sure you use a twisted-pair cable with an impedance of 120 Ω. If the cable will be used outdoors, choose cables with high UV resistance.*

| **Area of Use** | **Cable Type / Feature** | **Recommended Belden Cable** | **Equivalent Local Cable Designation** |
|---|---|---|---|
| Indoor | Standard (PVC Jacket) | Belden 9841 | LI2Y(St)CH / LIYCY(TP) |
| Indoor | Halogen-Free (LSZH/ HFFR) | Belden 9841NH | LI2Y(St)CH |
| Outdoor | UV Resistant | Belden 3105T | LI2Y(St)C2Y |
| Outdoor | Armored (Underground Runs) | Belden 9841LS | LI2Y(St)C2Y-SWA |

## LED Selection

To get flawless dimming performance from your DMX Constant Current decoders and to maintain the thermal/electrical stability of the device, the following rules must be strictly observed when selecting and connecting LEDs.

### Information Note for LED Module Designers

For the decoder to provide stable current regulation and remain stable during PWM/linear dimming transitions, the total forward voltage ($V_{LED}$) of the LED modules to be connected should not exceed 75% of the input supply voltage ($V_{IN}$). Exceeding this limit may cause a drop in output current or loss of regulation.

Recommended Number of Standard LEDs in Series per Channel: When using standard lighting LEDs with an average operating voltage of 3V, the recommended number of LEDs in series per channel, depending on your power supply voltage, is as follows:

- For 12V DC Supply: 3 LEDs in Series *(Approx. 9V)*
- For 24V DC Supply: 6 LEDs in Series *(Approx. 18V)*
- For 36V DC Supply: 9 LEDs in Series *(Approx. 27V)*
- For 48V DC Supply: 12 LEDs in Series *(Approx. 36V)*

## Device Settings

This device supports the standard ANSI E1.20 RDM protocol.

Since this model has no physical display or buttons, all device parameters, including the DMX Start Address, Channel Modes and Gamma Correction, are configured remotely via the RDM protocol (using the Zenopix Explorer software or standard RDM controllers) rather than on the device itself. The RDM parameter codes (opcodes) used for device configuration are listed below:

1. ***DMX Start Address - RDM Parameter Code: 0x00F0***

   The device's start address in the DMX512 universe (assignable from 1 to 512). Starting at this address, the device processes the number of consecutive DMX channels specified by the selected mode. The default start address is 1.

2. ***Channel Modes and Count - RDM Parameter Code: 0x8003 (CH1 to CH4)***
   Determines how many DMX channels control the device and how these channels are mapped to the physical outputs. The default channel count is 4. Select one of the four modes below:

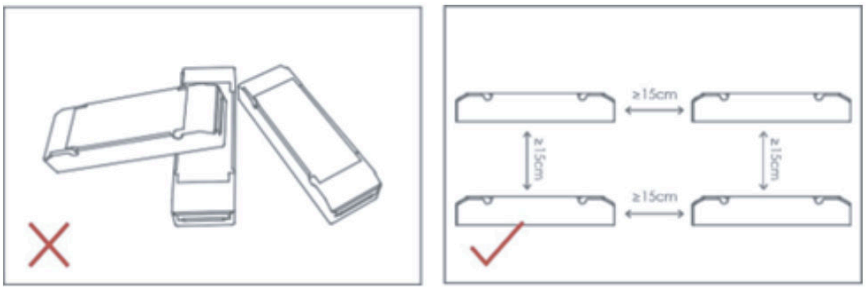
| **Mode** | **DMX Channel Count** | **Output Mapping** |
|---|---|---|
| CH1 | 1 | All outputs follow channel 1. |
| CH2 | 2 | Outputs 1-2 → channel 1; 3-4 → channel 2. |
| CH3 | 3 | Output 1 → channel 1;<br>Output 2 → channel 2;<br>Outputs 3-4 → channel 3. |
| CH4 | 4 | Each output follows its own channel independently. |

### *3. Gamma Correction - RDM Parameter Code: 0x8004*

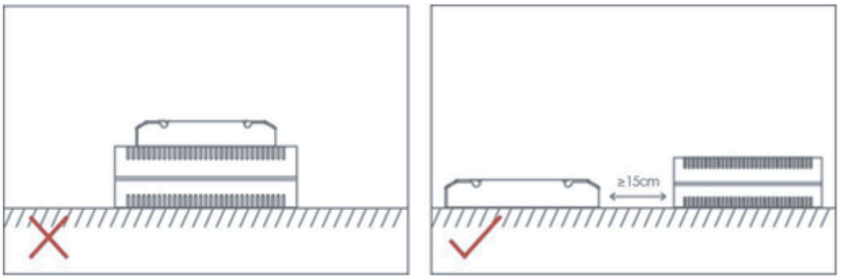
Gamma correction adjusts DMX dimming levels to match human brightness perception, producing smooth, natural transitions. Via RDM, it can be set between $\gamma$ 1.0 and $\gamma$ 2.8. The default gamma correction value is 1.0.

*For more detailed information on RDM parameters and packet structure, see the Zenopix RDM user manual page. For managing and configuring the device over the RDM protocol, Zenopix Magus can be used as the RDM master device; you can also use the Zenopix Explorer software for RDM monitoring and management.*

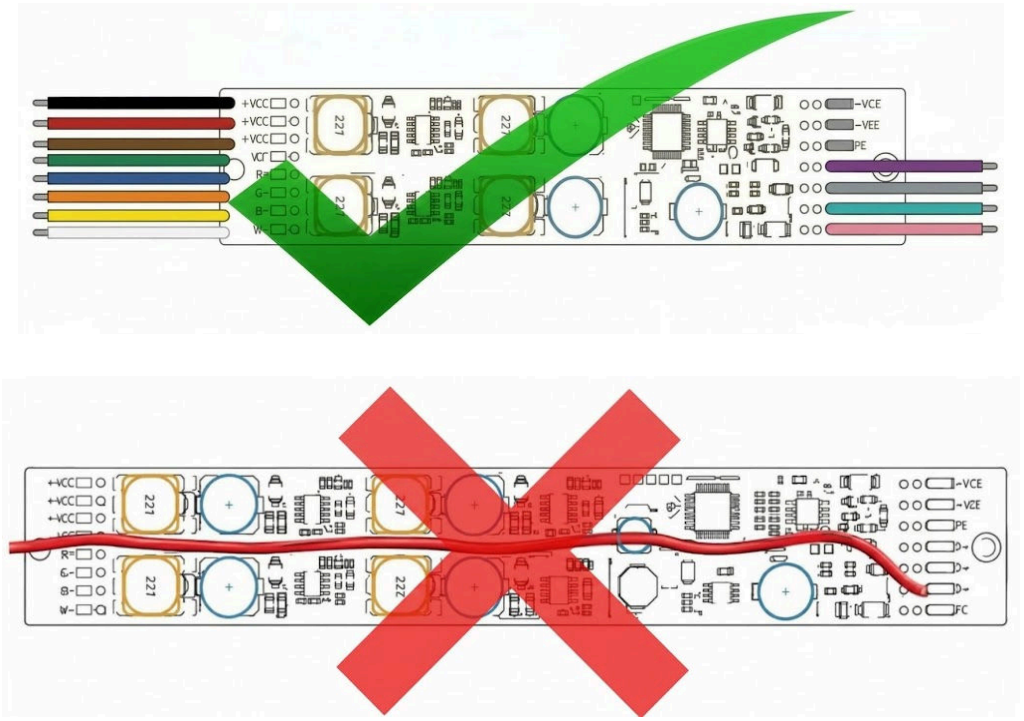
## Installation and Precautions



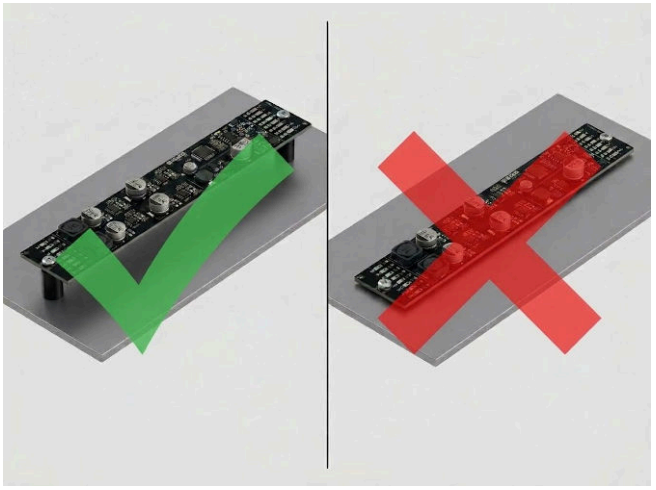

Please do not stack the products on top of each other. Leave **more than 15 cm** between two devices so as not to adversely affect heat dissipation or the service life of the products.



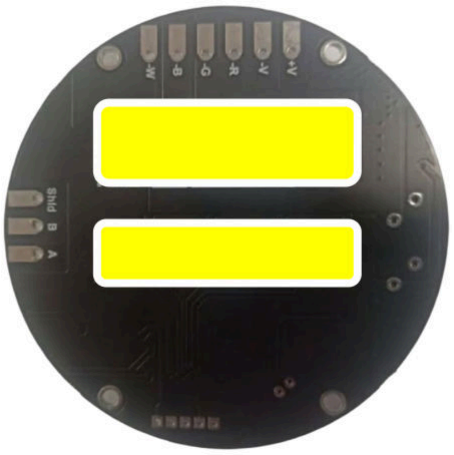

Please do not place the products on top of LED drivers. Leave **at least 15 cm** between the product and the driver to ensure proper heat dissipation and to prevent shortening the service life of the devices.




When wiring the product, do not route signal/power cables between the components. Make sure that any mechanical strain on the cables cannot damage the device. Plan the wiring of the product from the inside out.



Prevent the device from coming into direct contact with metal or conductive surfaces. Electrically isolating the device from conductive surfaces is entirely the user's responsibility. Short circuits caused by contact with conductive/metal surfaces pose a risk of arcing and fire. During installation, using insulating spacers (PCB standoffs), a suitably sized mounting channel, an insulating thermal pad or electrical insulation sleeving, or mounting directly on an insulating surface, is recommended.



If you will use the product in high-current applications (>500mA per channel) or where it will be exposed to high temperatures, it is recommended to apply a thermal pad to the points shown in the figure above or to the entire rear surface (without components) to transfer heat to another surface.

## WARNINGS

- The products must be installed by qualified professionals.
- This product is an unenclosed PCB and **is not waterproof**. Please protect it from physical impact, sun, water and rain. This product is not suitable for direct outdoor installation. If it will be used outdoors, make sure it is mounted in a waterproof enclosure. The user is responsible for outdoor use. Good heat dissipation will extend the service life of the products. Please ensure good ventilation.
- Make sure the operating voltage meets the product specifications.
- The cable gauge used must be sufficient to supply the connected lighting fixtures, and the cable connection must be secure.
- Before switching on the products, please make sure that all wiring is correct, as an incorrect connection may damage the lighting fixtures. If a fault occurs, please do not attempt to repair the products yourself. If you have any questions, please contact your suppliers.
- This manual is subject to change without prior notice. If you have any questions, please do not hesitate to contact us.

## Technical Support

If you have further questions about the use of the Zenopix Round decoder or technical problems, use the following resources for troubleshooting:

- Read the Zenopix Constant Current Decoder user manual
- Contact your supplier or sales representative.
- Check our website for the latest information
- For any technical problem, you can contact us directly at info@zenopix.com.

## Frequently Asked Questions (FAQ)

### Can I use multiple Round decoders at the same time?

Yes, you can.

### Does this decoder support RDM?

Yes, the device supports RDM. For management via RDM, you can use the Zenopix Magus device with the Zenopix Explorer software.

### What equipment is recommended for use with this device?

It is recommended to use it with Zenopix Magus for RDM applications, and with Zenopix Elea or Zenopix AER for DMX-only applications. The device can also operate with all controllers compliant with the DMX512 Standard.

### I am experiencing flicker or latency in LED fixtures. What could be the cause?

- No 120 Ω termination resistor at the end of the DMX line.
- The cable between the decoder and the LEDs is too long (>5 meters)
- The power supply cannot provide sufficient current.

- Non-standard cabling or exceeding the maximum signal transmission distance (>100 meters).
- Too many end nodes (decoders) on the line (>32)
- Delay of data packets due to heavy traffic on the Ethernet network

**The distance between the controller and the decoders is too long (>100 meters). What should I do?**

To extend the signal cable or prevent signal degradation, see the Zenopix Repeater products.

**How can I address the devices?**

You can address the devices using Zenopix Magus or any standard RDM controller. For easy addressing in the field, see the Zenopix RDM/DMX Address Writer product.

**How many devices can I use on one DMX/RDM line?**

The recommended maximum number of devices per line (Universe) is 32. For applications with more than 32 devices per line, 1 signal amplifier or repeater must be used for every 32 devices.

**Can I use the device channels in parallel?**

Yes, in Zenopix CC decoder series, output channels can be combined to increase the current. The resulting current equals the sum of the individual channel currents. This requires additional configuration via RDM.

### Channel Mode Selection and Combining Output Terminals

According to the saved channel mode, the outputs are physically combined and mapped as shown in the table below. In 4-channel mode, the output order is 1 red, 2 green, 3 blue, 4 white. The default mode is CH4. This parameter can be configured remotely via RDM.

| **Mode** | **Output mapping** |
|---|---|
| 1 Ch. | All four outputs are driven by channel 1 data. |
| 2 Ch. | Outputs 1 and 2 → channel 1 data; Outputs 3 and 4 → channel 2 data. |
| 3 Ch. | Output 1 → channel 1; Output 2 → channel 2; Outputs 3 and 4 → channel 3 data. |
| 4 Ch. | Each output follows its own channel (1–4). |

## Order Code

| PRODUCT CODE | RDMXCC | 015 | RD | ST |
|---|---|---|---|---|
| **Capacity** | | | | |
| 150mA per channel | | 015 | | |
| 350mA per channel | | 035 | | |
| 500mA per channel | | 050 | | |
| 700mA per channel | | 070 | | |
| 1050mA per channel | | 105 | | |
| 1400mA per channel | | 140 | | |
| **Enclosure Type** | | | | |
| Round PCB | | | RD | |
| **Connection** | | | | |
| Screw Terminal Blocks | | | | ST |
| Pluggable Terminal Blocks | | | | PT |
| Solder Pads without Terminal Blocks | | | | SL |

**** The standard current values are 150mA, 350mA, 500mA, 700mA, 1050mA and 1400mA. Units with intermediate current values are produced and shipped from the factory.***
***Contact your sales representative for custom values.***

*Your lighting solution partner*

Zenopix is an R&D, technology and manufacturing company specialized in lighting control systems, built on nearly twenty years of expertise in electronics and software.

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