ZENOPIX
smart solutions

Your Solution Partner in Lighting Control

DMX & RDM CONSTANT VOLTAGE DECODER

USER MANUAL



Version 3 / October 2026

zenopix.com



Thank you for choosing the Zenopix DMX & RDM Constant Voltage 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

ZENOPIX LIMITED COMPANY

Ankara Office

Elmar Tower Konutkent Mah. 3028. Cad. No:8C/120 Çankaya / Ankara / Türkiye I +90 312 911 26 46

R&D and Production

Fevziçakmak Mah. Medcezir Cad. Büsan OSB KTM A Blok No:123 Karatay / Konya / Türkiye I +90 332 503 67 77

Konya Teknokent Office

Akademi Mah. Gürbulut Sok. S.Ü. Teknoloji Geliştirme Bölgesi Konya Teknokent No: 67 Selçuklu / Konya / Türkiye I +90 332 503 67 77

E-mail: info@zenopix.com

Website: https://www.zenopix.com

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Safe Use

Use the device only in dry environments (indoors). The IP rating of the device is IP20. 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 or connect it 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 interface. Repair service is the sole responsibility of the manufacturer. If the interface 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 Voltage 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

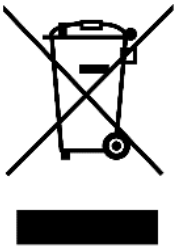
1× Zenopix DMX & RDM Constant Voltage Decoder

1× Device Test Report

NOTE: After opening the package, check the contents of the package and the condition of the interface! 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 Voltage Decoder is a professional LED driver that processes standard DMX512 signals and supplies constant voltage 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 0%–100% dimming for outstanding performance in architectural and stage lighting applications, while its built-in gamma correction allows precise adjustment of brightness curves.

Features

- Operating voltage up to 48V.
- Flicker-free thanks to high-frequency switching.
- Built-in current and voltage sensor.
- Built-in temperature sensor.
- RDM support.
- Easy installation and easy testing.
- Built-in gamma correction.
- Terminal block connection for common anode applications.
- Built-in 120Ω termination resistor.
- Easy monitoring during installation with the built-in LED on the device.

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:

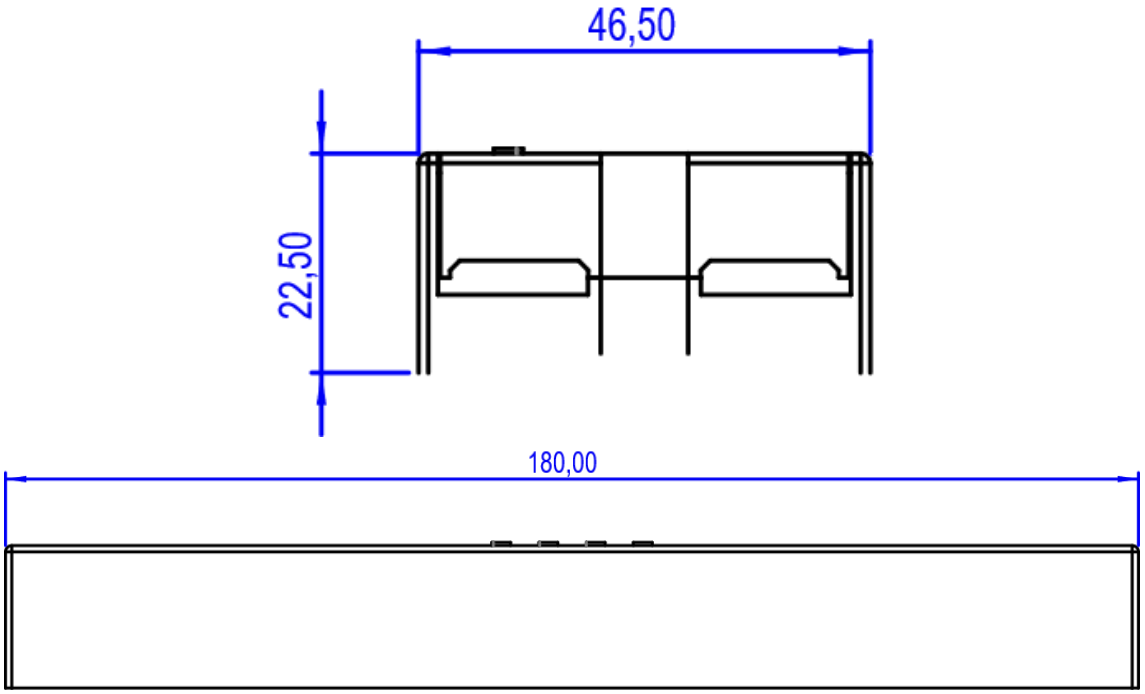
⚠️	This device operates at low voltage (DC 12-48V). Do not use lower or higher voltages. Do not apply reverse-polarity voltage to the device.
⚠️	Any external power supply to be connected must be fused according to its output power and/or protected against short circuits.
⚠️	It is the user's responsibility 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. Unsuitable cross-sections can cause overheating, voltage drop and short-circuit risk, creating a fire hazard; this responsibility lies entirely with the user.

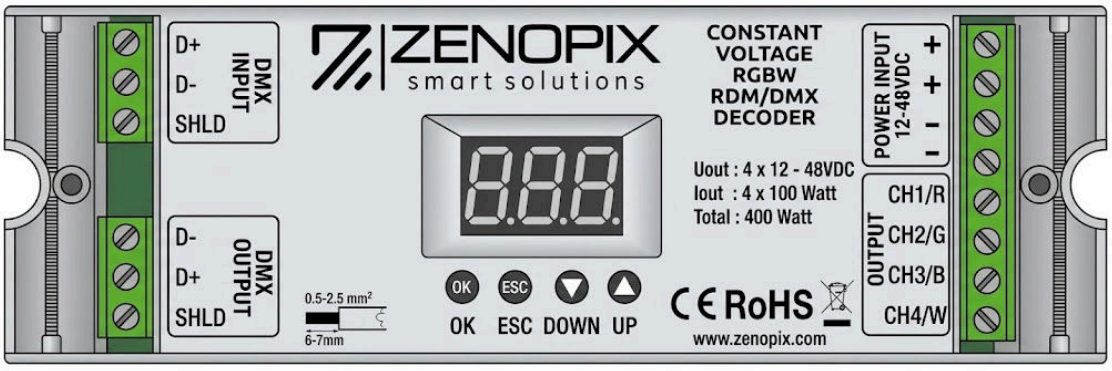
Technical Specifications

Dimming Interface	DMX512/RDM
Input Voltage Range	12-48VDC
Output Voltage Range	PWM from 0V to input voltage
Max Output Range	0-48VDC
No-Load Output Voltage	=Vin
Drive Method	Common Anode (LED + terminals common)
Continuous Output Current	20A (5A*4CH)
Peak Output Current	24A (6A*4CH) Maximum 2 minutes
Current sensing range	0-30A (Total of all channels)
Current accuracy	± 50mA
Voltage sensing range	0-48V
Voltage accuracy	± 1V
Temperature accuracy	±10%
Continuous Power (4CH)	Continuous Output Power 24Vx20A = 480W (4CH) 48Vx10A = 480W (4CH)
Dimming Range	0~100%
Dimming method	PWM
Drive Frequency	100Hz – 90,000 Hz (Default 2,000 Hz)
Dimensions	Boxed: 46.50x180x22.50mm
Weight	140g (Boxed) - 54g (Without box)
Ripple and Noise	≤2V (without dimming)
Operating temp./humidity	-10°C, +70°C / 20 ~ 70%RH, non-condensing
Storage temp./humidity	-20°C ~ 80°C, 0~ 80% RH, Non-Condensing
Protection	IP20
Certificates	CE, RoHS

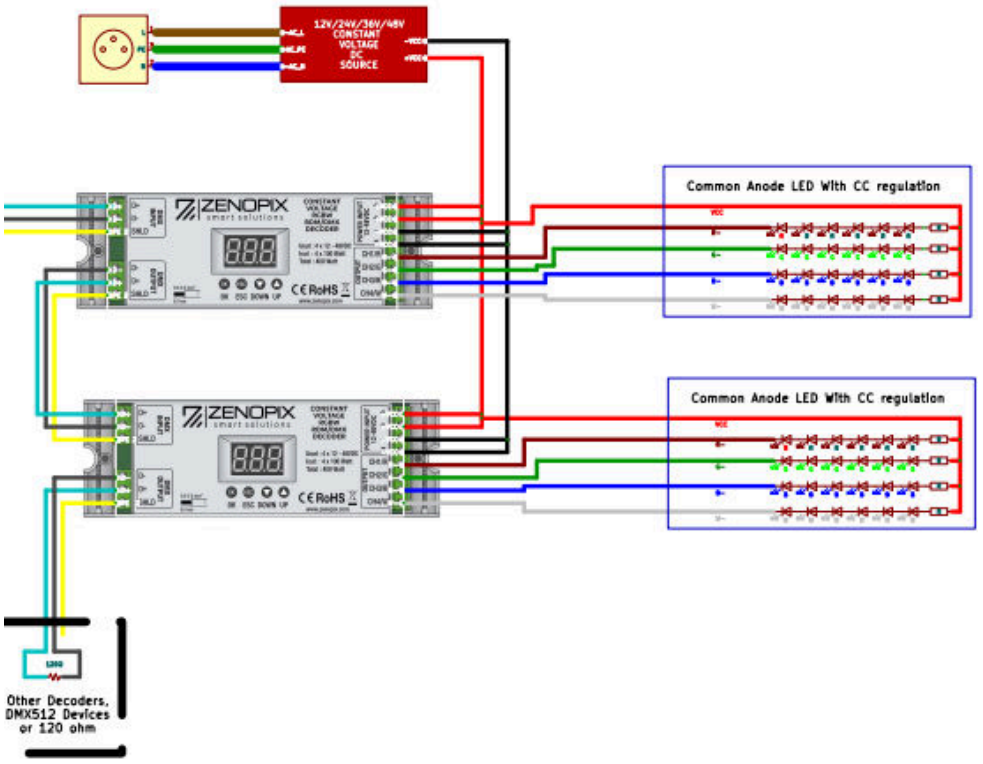
Recommendation: You can choose a DC power supply that meets your current and voltage requirements. A power supply with short-circuit protection is recommended. For example, Mean Well LRS Series can be used.

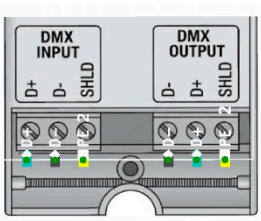
Device Dimensions



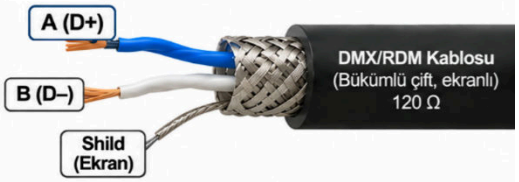


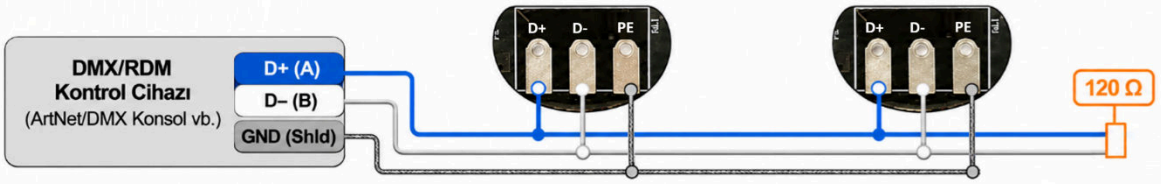
Pin Connections





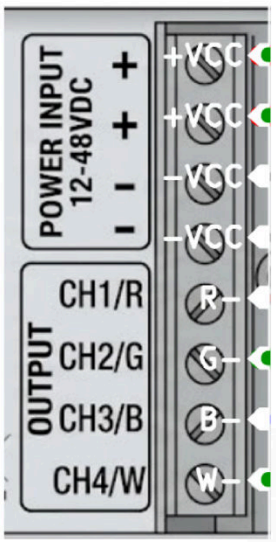
Pin	DMX/RDM (RS-485)	Açıklama
A	D+ (Data +)	Pozitif (+) hat
B	D– (Data –)	Negatif (–) hat
PE SHLD	Shield	Kablo ekranı Protective Earth

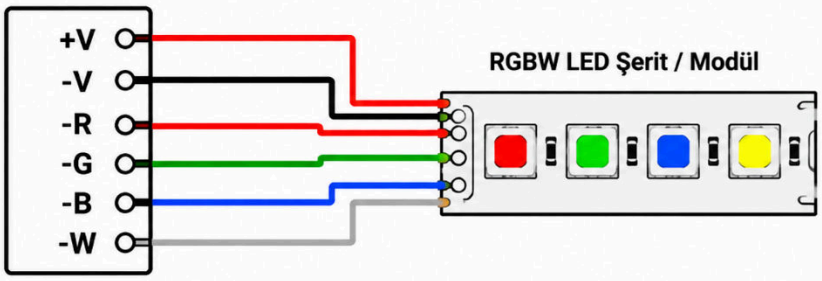




- Bağlantı eşleştirmesi (PCB'ye uygun): **A** = D+ (Data +), **B** = D– (Data –), **Shld** = ekran.
- DMX/RDM (RS-485) için 120 Ω empedanslı, bükümlü çift, ekranlı kablo kullanın.
- Hat topolojisi: tek hat (daisy-chain). Yıldız (star) bağlantıdan kaçının.
- Hat sonunda **D+ (A)** ile **D– (B)** arasına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

Pin	Adı	Açıklama
+V	V+	Besleme pozitif (+)
-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, choose the cable cross-section and connector ratings to suit your current requirements.
- A data cable impedance of 120 Ω is recommended. Half-duplex RS485 or DMX cable is recommended.
- If your LED current is >5A, 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 <3A. However, carrying power through the product is not recommended. In applications where the total current exceeds 3A, 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.
- The connection must be made by technically 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:*** *Belden cable recommendations for DMX cable are given 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**	**General Local Code Equivalent**
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

Device Menus

You can control the display menu with the buttons on the device.

Saved values show lit decimal points; they turn off while the value is being changed. Menu behavior follows software 2.3.4.

OK

"OK"; Enters the menu and saves the value. Hold for about half a second. A short tap is not detected.

ESC

"ESC"; Returns to the menu list from the value screen. Ends test. No saving.

DOWN

"DOWN"; Previous menu item; on the value screen, decreases the value by one.

UP

"UP"; Next menu item; on the value screen, increases the value by one (repeats when held).

MENU

#MENU "P01"; DMX start address. 001–512. Default 001.

#MENU "P02"; Channel mode. CH1–CH4. Default CH4.

#MENU "P03"; PWM frequency. 0.1–90.0 kHz (100 Hz–90 kHz). Default 02.0 (2 kHz).

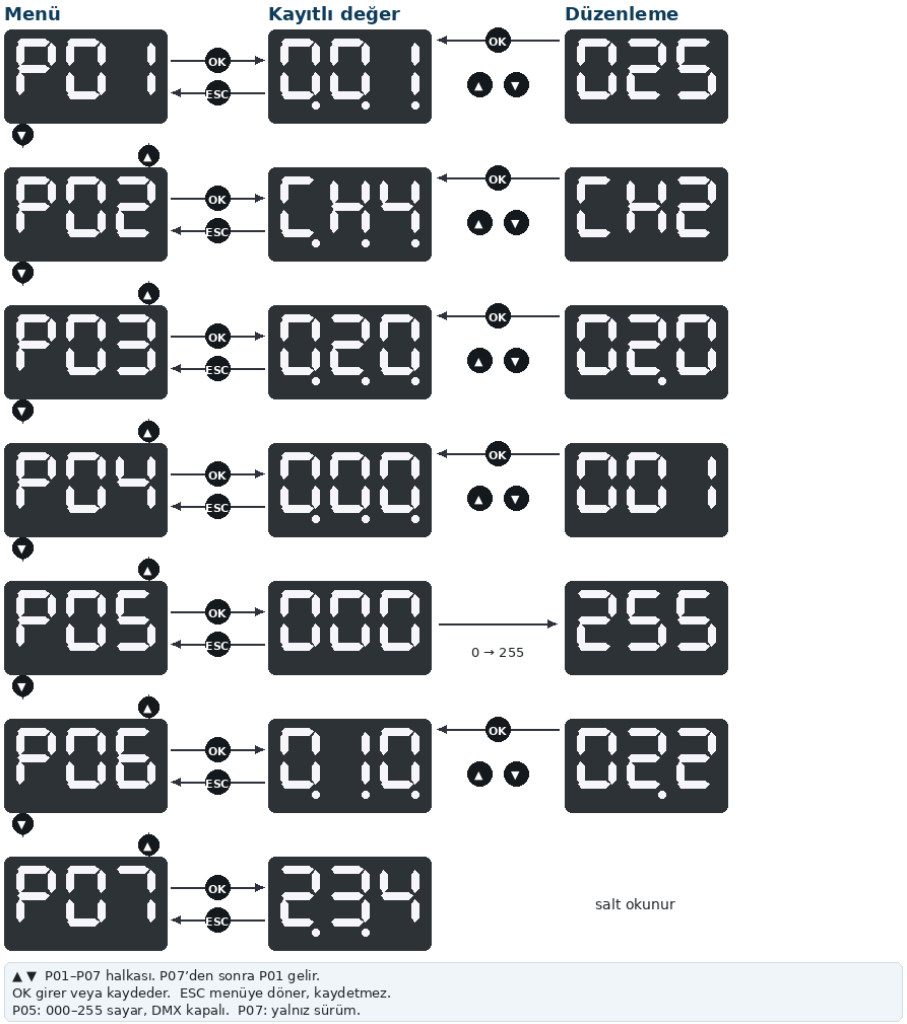
#MENU "P04"; Addressing via DMX line. 000 off, 001 on. Default 000.

#MENU "P05"; Output test (000–255). DMX input is ignored during the test.

#MENU "P06"; Gamma correction. 1.0–2.8. Default 1.0.

#MENU "P07"; Software version. 2.3.4 in this version. Cannot be changed.

Menu Diagram



Addressing on the Device (P01)

P01 changes the DMX start address and writes it to non-volatile memory.

Addressing sequence on the display:

Find P01 with UP/DOWN; press OK to open the saved address. Pick a new address (001–512) with UP/DOWN; OK saves, ESC returns to the menu list.

Starting from the selected address, the device uses as many DMX channels as set in P02. The last channel used must not exceed 512.

Channel Selection (P02)

Outputs are mapped by the saved channel mode as follows. Output order: 1 red, 2 green, 3 blue, 4 white. The default mode is CH4. This parameter can also be configured remotely via RDM.

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; Output 2 → channel 2; Outputs 3-4 → channel 3.
CH4	4	Each output follows its own channel (1, 2, 3, 4).

Setting the Drive Frequency (P03)

By default, the device is set to a 2 kHz drive frequency. The display is in kilohertz: 00.1 = 100 Hz, 02.0 = 2 kHz, 90.0 = 90 kHz. The step is 100 Hz. Changing this setting carelessly may cause flicker and shimmering. It is recommended not to change it unless necessary. The drive frequency can also be set remotely using the RDM protocol.

Addressing via the DMX Line (P04)

000 (off) is the default; the address then changes only via the display or RDM. With 001 (on), the device accepts a special address command on the DMX line: not an RDM packet, but a DMX frame with start code 0x00, always read from channels 1–14 regardless of the device's own address. The command is ignored during the test.

Channels 1–6 and 9–14 are a fixed signature: 55 0F 2C AA 35 03. Channels 7 and 8 carry the address; each received byte is bit-reversed.

New address = (bit-reversed channel 7 AND 7F) × 64 + (bit-reversed channel 8 AND 3F) + 1. If the signature does not match, the address is unchanged; if it matches, the value is saved to non-volatile memory as P01.

Address	Channel 7	Channel 8
1	00	00
10	00	90
65	80	00
512	E0	FC

Because the command uses channels 1–14, a decoder addressed in this range may interpret these bytes as dimming levels during the command frame. If the addressing device writes the address only via RDM, leave P04 at 000; if it uses the DMX signature frame, set P04 to 001.

Test Procedure on the Device (P05)

After connecting and powering the device, select P05 with UP/DOWN and press OK to start. The displayed value rises from 000 to 255 and returns to 000; the test then advances to the next output in the saved channel mode order. In CH1, all four outputs ramp up and down together. DMX input is ignored during the test. ESC or another menu stops it. The test is not saved.

Gamma Correction (P06)

Gamma is the curve applied to the DMX level before it is converted to a PWM ratio. The display ranges from 1.0 to 2.8 in steps of 0.1. The default 1.0 is linear. The exponent applied is the value shown on the display. Gamma correction settings can also be changed remotely via RDM.

Output = integer part (255 × (DMX ÷ 255) ^ γ). 0 and 255 stay the same for every gamma. Intermediate levels get smaller as gamma increases. The calculation is done after channel merging. PWM percentage = integer part (output × 100 ÷ 255).

DMX	**γ 1.0**	**γ 2.2**	**γ 2.8**
0	0	0	0
64	64	12	5
128	128	55	37
255	255	255	255

Version information (P07)

P07 displays the software version as a read-only value. The display shows 2.3.4. The same number is also returned in response to an RDM software version query.

Device Menus (Boxed Models with Buttons)

You can control the display menu with the buttons on the device.

Saved values show lit decimal points; they turn off while the value is being changed. Menu behavior follows software 2.3.4.

OK

"OK"; Enters the menu and saves the value. Hold for about half a second. A short tap is not detected.

ESC

"ESC"; Returns to the menu list from the value screen. Ends test. No saving.

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"DOWN"; Previous menu item; on the value screen, decreases the value by one.

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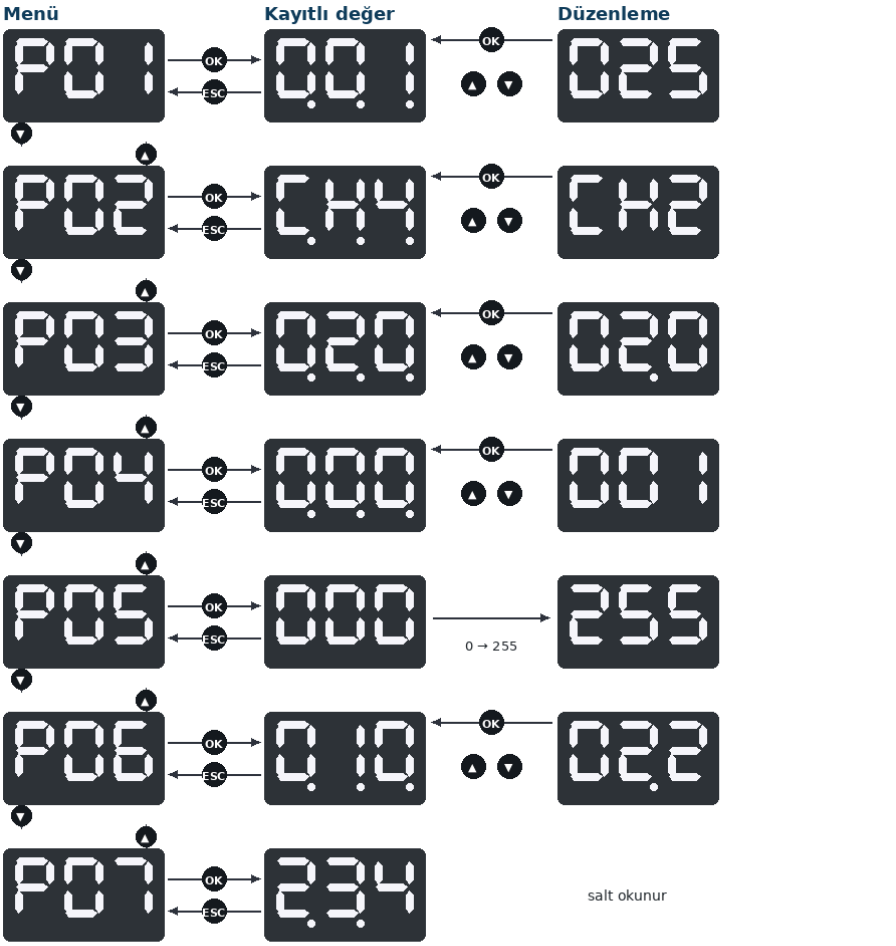
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Mode	DMX	Output mapping
CH1	1	All four outputs follow channel 1.
CH2	2	Outputs 1-2 → ch 1. Outputs 3-4 → ch 2.
CH3	3	Output 1 → ch 1, Output 2 → ch 2, Outputs 3-4 → ch 3.
CH4 (Default)	4	Each output follows its own channel (1–4).

Frequency Setting (P03)

Reserved. Sets the driver PWM frequency; changing it is not recommended.

Addressing via the DMX Line (P04)

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DMX	**γ 1.0**	**γ 2.2**	**γ 2.8**
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64	64	12	5
128	128	55	37
255	255	255	255

Version information (P07)

P07 displays the software version as a read-only value. The display shows 2.3.4. The same number is also returned in response to an RDM software version query.

Sensor Reading

The decoder continuously takes six measurements. These values are not shown as a menu on the front panel. An RDM-enabled controller is used to read them. Zenopix Magus and Explorer show these values in the sensor list.

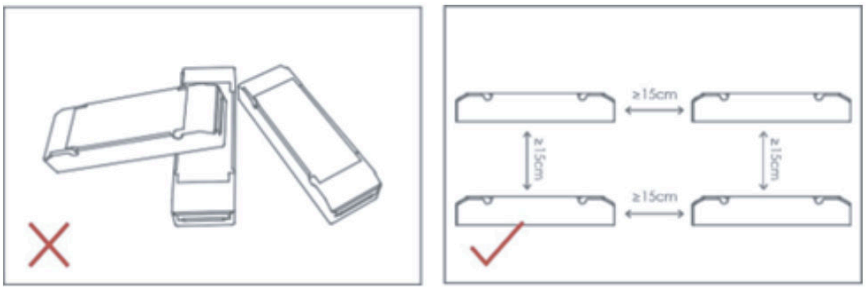
A measurement is taken approximately every 0.1 seconds. The published result is the average of ten samples. For each sensor, the current value and the lowest and highest values seen during operation are reported. The extreme values are retained as long as the power stays on.

No	Name	Measurement	Resolution	Normal range
0	Input Voltage	Supply voltage	0.1 V	5 – 50 V
1	Current	Current	0.001 A	0 – 30A
2	CH1 Temp	Output 1, red	1 °C	-20 … +50 °C
3	CH2 Temp	Output 2, green	1 °C	-20 … +50 °C
4	CH3 Temp	Output 3, blue	1 °C	-20 … +50 °C
5	CH4 Temp	Output 4, white	1 °C	-20 … +50 °C

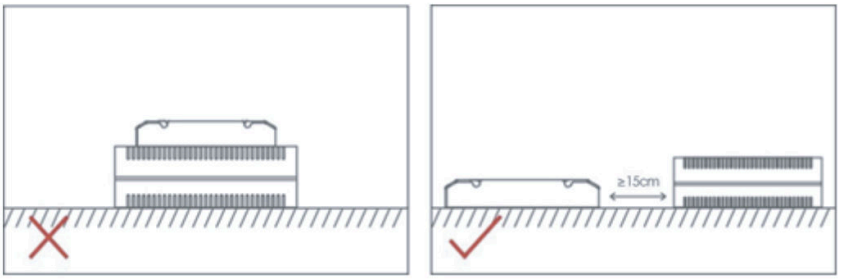
Voltage example: if the controller shows 240, the supply is 24VDC. Current example: 1500 means 1.500 A. Temperature is reported directly in degrees Celsius. The product's supply operating range is 12–48 VDC. The window in the table is the normal range reported by RDM.

A measurement outside the normal range does not generate a fault code on the front panel. It is evaluated in the sensor status on the RDM controller.

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.

WARNINGS

- The products must be installed by qualified professionals.
- This product has an IP20 protection rating 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 Decoder or technical problems, use the following resources for troubleshooting:

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

Frequently Asked Questions (FAQ)

Can I use multiple Boxed Decoders with Buttons 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, you can check out Zenopix Repeater products.

How can I address the devices?

You can address the device using Zenopix Magus or any standard RDM controller. For easy addressing in the field, you can check out the Zenopix Addresser product.

On models with a display and buttons, you can also use the device buttons to set the address in the P01 menu (see Addressing on the Device (P01)).

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?

No, you cannot parallel the output channels of the Zenopix CV decoder. However, in Channel Selection (P02), you can set all outputs to follow the same DMX channel while keeping them electrically separate. Do not parallel the outputs directly with wiring.

Order Code

PRODUCT CODE	RDMXCV	4	BB	ST
Capacity				
4 Channels		4		
Enclosure Type				
Bare Board (PCB Only)			BB	
Enclosed			EB	
Enclosed with Display and Buttons*			DB	
Connection				
Screw Terminal Blocks				ST
Solder Pads without Terminal Blocks				SL

**** For Enclosed with Display and Buttons, only the Screw Terminal Bloks option is available.***

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.

Ankara Office
Elmar Tower Konutkent Mah. 3028. Cad.
No:8C/120 Çankaya / Ankara / Türkiye
+90 312 911 26 46
R&D and Production
Fevziçakmak Mah. Medcezir Cad. Büsan OSB
KTM A Blok No: 123 Karatay / Konya / Türkiye
info@zenopix.com
+90 332 503 67 77
zenopix.com