ZENOPIX smart solutions

Your Solution Partner in Lighting Control

AER

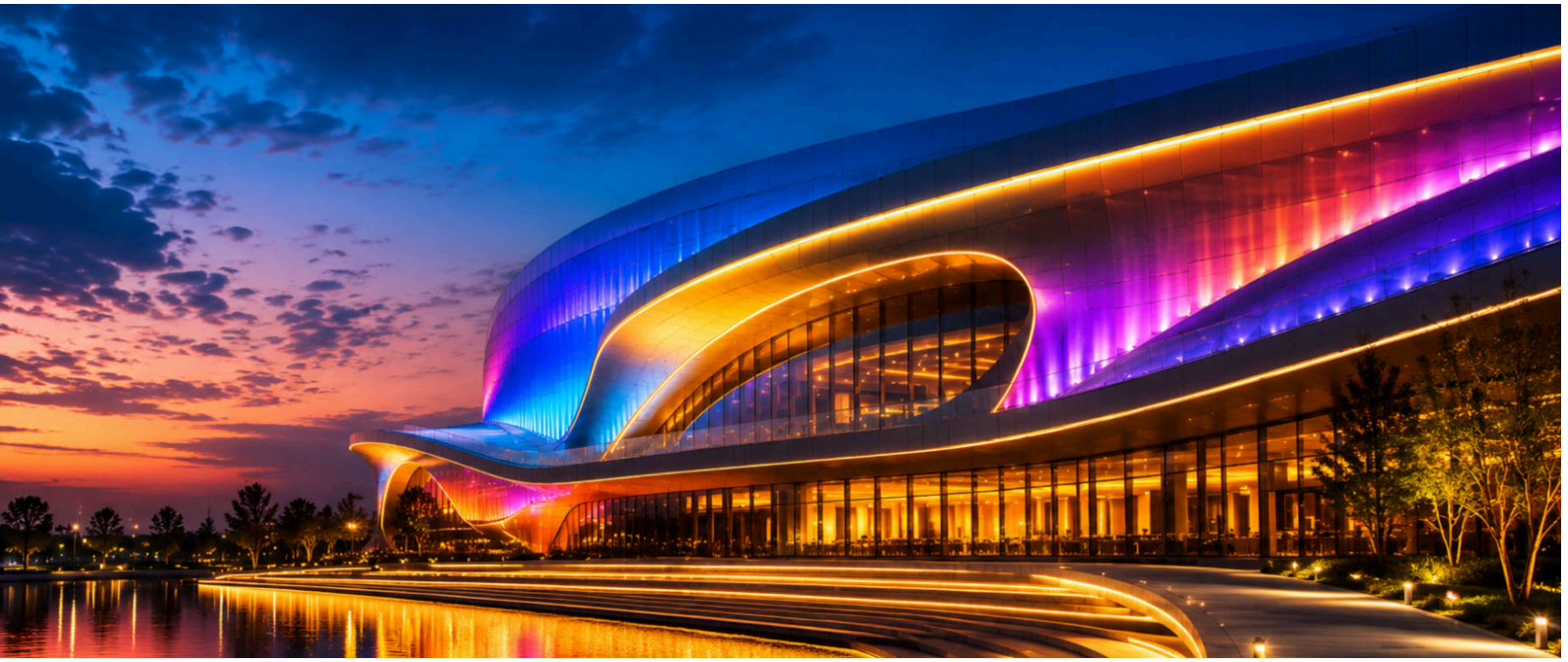
DMX/SPI STANDALONE CONTROLLER (WITH SD CARD)

USER MANUAL



Version 3 / October 2026

zenopix.com



Thank you for choosing the Zenopix AER.

Please read this user manual before using the product. If you experience any technical problem, you can contact our company and receive technical support using the information below.

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Safe Use

Use the device only in dry environments (indoors). The device has an IP rating of IP20. Do not use the device in humid environments; avoid contact with water or other liquids. Switch off the power if you will not be using the device for a long time. Galvanic isolation is always recommended. Do not remove any parts from the unit or connect it to an ungrounded circuit. Do not connect the unit to LEDs that are switched on. Switch off the LEDs and controllers before connecting them to the unit. 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 may, where possible, contact your supplier or the manufacturer to have the unit repaired for an individual 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 AER is covered by a manufacturer's warranty of 5 years in total: 2 years standard with an option to extend by 3 years. Detailed information is available in the product's warranty certificate or on our website.

Box Contents

1x Zenopix AER

1x Power Adapter (XLR version only)

1x SD card (Installed)

1x 2.4 GHz antenna

1x Terminal block accessories bag (terminal block version only)

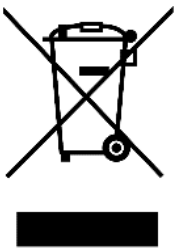
1x Technical documentation and product guide

1x Warranty Certificate

1x Device Test Report

NOTE: After opening the package, check the package 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 followed in full, this device poses no risk to human health or the environment. The device must not be disposed of with household waste; it must be handed over to an electrical and electronic equipment recycling center. It must be recycled or destroyed without harming nature or human health.

Introduction

Zenopix AER is a standalone controller designed to drive DMX512 and SPI lighting fixtures, record animations and play back stored content. Featuring **Wi-Fi connectivity** and **SD card** storage, the device transmits **DMX** or **SPI** data to lighting fixtures, and it can play prerecorded animations directly from the SD card and output DMX or SPI data without a PC. The device is offered with Terminal Block (TB) or XLR connector output hardware options. The controller has 8 physical DMX/SPI output ports, corresponding to 8 universes. Up to 1,024 DMX channels or 4,096 SPI channels are supported per universe. Recommended per output: 512 DMX channels or up to 3,072 SPI channels. At the maximum supported channel counts, the frame rate drops. Data is transmitted in DMX or SPI format. The device distributes the high-speed data stream directly to the connected fixture groups.

Equipped with an integrated Wi-Fi module, the device can operate in both **Access Point (AP)** and **Station (STA)** modes. This allows the unit to broadcast its own wireless network or join an existing site Wi-Fi network as a client. System configuration, IP parameters and content management are handled entirely through the embedded web interface, accessed via standard web browsers.

- **8 DMX/SPI Output Ports:** Up to 8 universes of **DMX**/**SPI** data output via Terminal Block (TB) or XLR connectors.
- **Standalone Operation:** Playback of pre-recorded animations directly from an SD card, without a PC.
- **Flexible Wi-Fi Modes:** Dual-mode support (Access Point and Station) provides seamless wireless integration.
- **Web-Based Management:** Full configuration, parameter adjustment and file management using any web browser.
- **Integrated LED Test Tool:** Built-in test sequences for hardware troubleshooting during installation.
- **Broad SPI Protocol Support:** Native compatibility with dozens of LED driver ICs, including GE88XX, GS19XX, GW62XX, MBIXXXX, MT16XX, MY92XX, PL98XX, SK68XX, SM16XX, TM18XX, TM19XX, UCS19XX, UCS29XX and WS28XX (custom protocol integration is available on request for chips not on this list.)

Safety Instructions

To prevent improper use of the device, damage to it or personal injury, please follow the instructions below:

⚠️	This device operates on low voltage (12-24VDC). Do not use lower or higher voltages.
⚠️	Any external power supply connected to the device must be fused appropriately for its output power and/or protected against short circuits.
⚠️	Protecting the device against lightning, electric shock and high-voltage surges is the user's responsibility. Make sure that all necessary electrical surge protection measures have been fully taken at the installation site.

Technical Specifications

Input Voltage Range	12-24VDC (Adapter or Terminal)
Power Consumption	<10 W (during normal operation)
Power Input	2-pin terminal block, 5.08 mm pitch (TB version) / 2.1 mm DC barrel jack (XLR version)
Network Protocol	Art-Net over UDP via Wi-Fi
Antenna Connector Type	SMA
Output Ports (Universes)	8 physical DMX/SPI output ports (8 universes)
Max. DMX Channels	1,024 per universe (512 recommended)
Max. SPI Channels	4,096 per universe (3,072 recommended)
Output Connectors	3-pin 5.08 mm TB / NEUTRIK 3-pin female XLR
Wi-Fi	802.11 b/g/n, 2.4 GHz, WPA2
SD Card	1x 32GB Class 10 Micro SD Card (FAT) Capacity for more than 1,000 animations
Status LEDs	3 pcs
Enclosure	6082 Aluminum
Dimensions	483x62x44mm
Weight	850g
Operating Temp. & Humidity	0°C ~ 60°C / 20 ~ 70% RH, non-condensing
Storage Temp. & Humidity	-10°C ~ 70°C, 0~ 70% RH, Non-Condensing
Protection	IP20
Certifications	CE, RoHS

Status LED Codes

Yellow LED: Power LED. It lights up when power is connected to the device.

Red LED: Indicates SD card status; the LED lights up when there is any fault or when the SD card is removed.

Green LED: Blinks at 2-second intervals. This indicates that the device is operating correctly.

During a factory reset, the red and green LEDs blink 10 times. The device then restarts in Access Point Mode, and the Wi-Fi settings, device name, LED type and port addresses return to their factory defaults.

Resetting to Factory Defaults

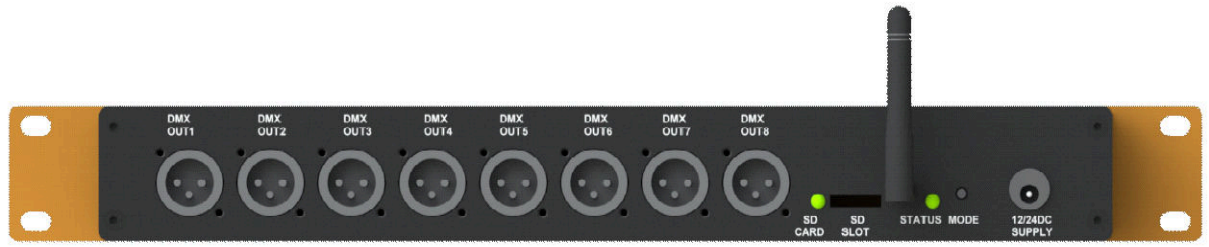
- Find a suitable tool to press the reset button on the front of the device.
- Press and hold the reset button for 10 seconds.
- Release the reset button after all status LEDs on the front of the device have blinked.

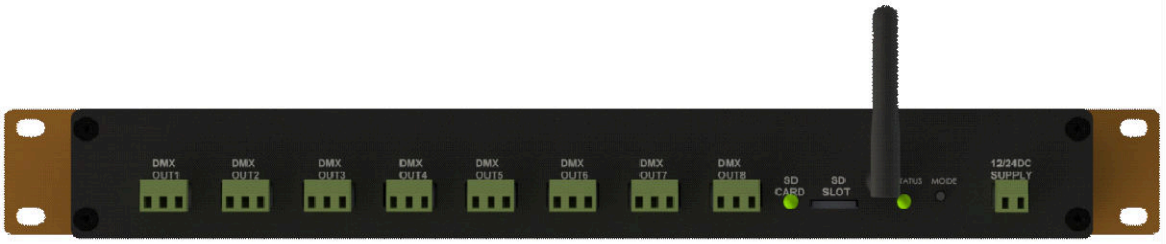
IP Address and Device Information

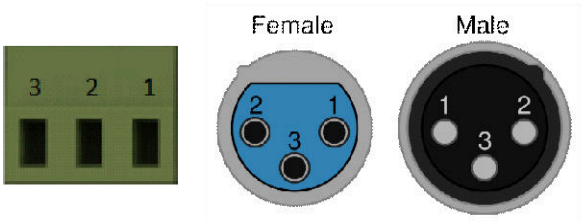
- Device serial number
- Device model
- Default IP address

You can find the information above on the device.

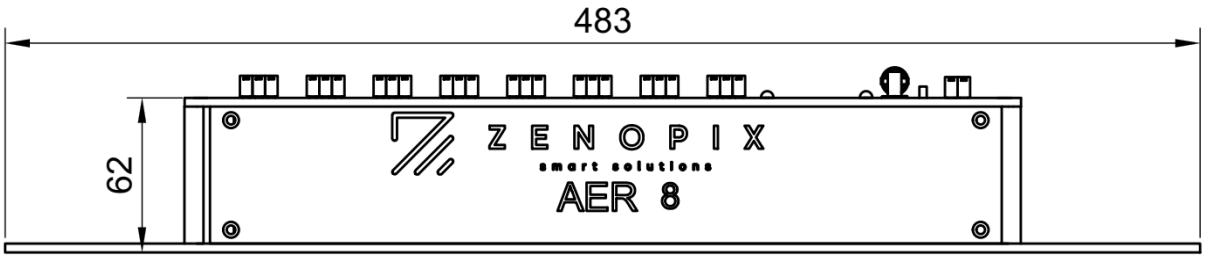
Device and Pin Connections

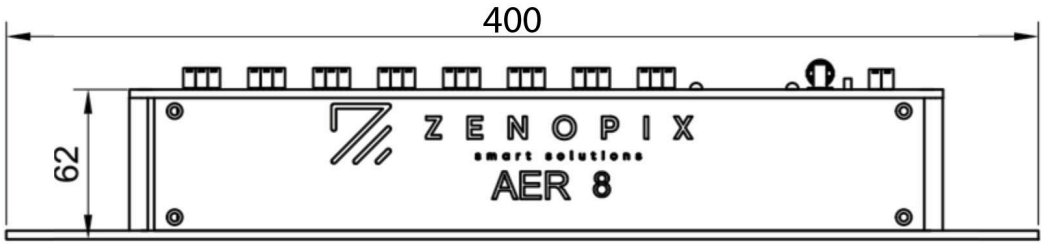


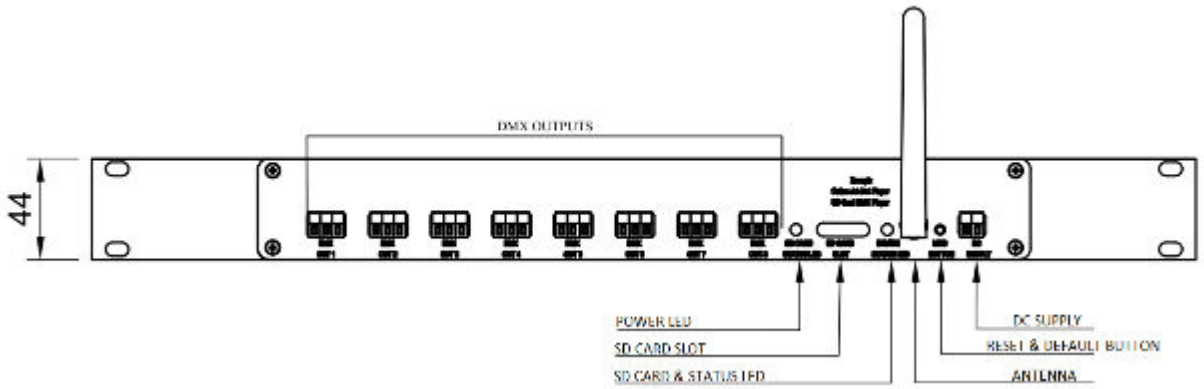


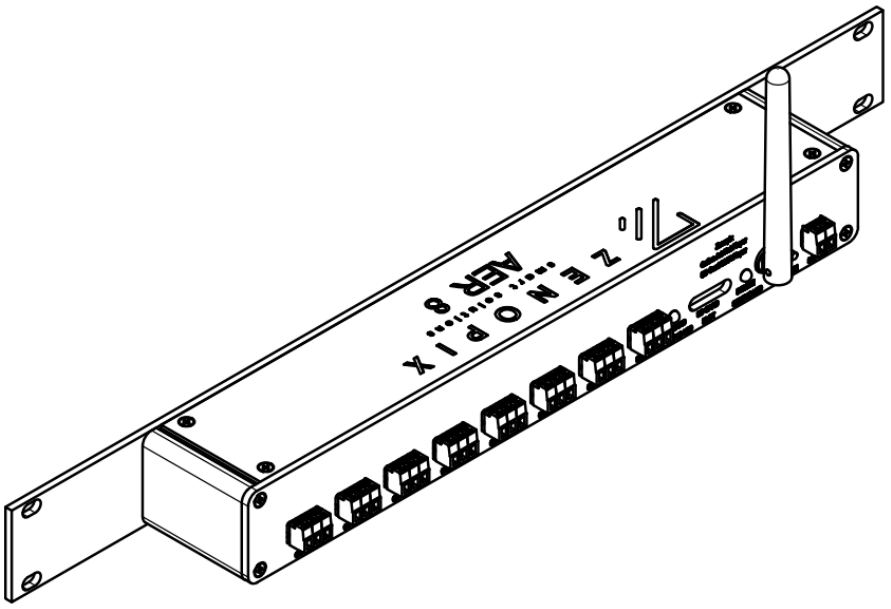


1-) Ground **2-) Data-(DMX)** **3-) Data+(DMX)/ Data(SPI)**

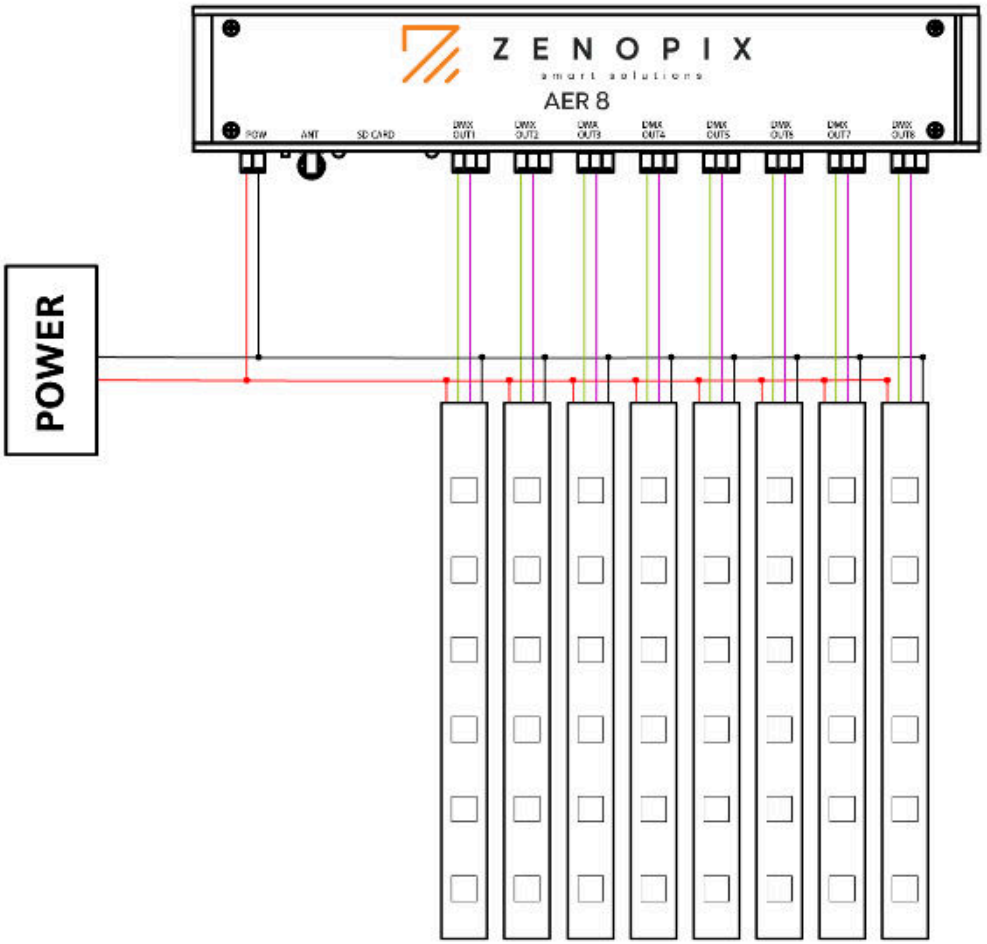






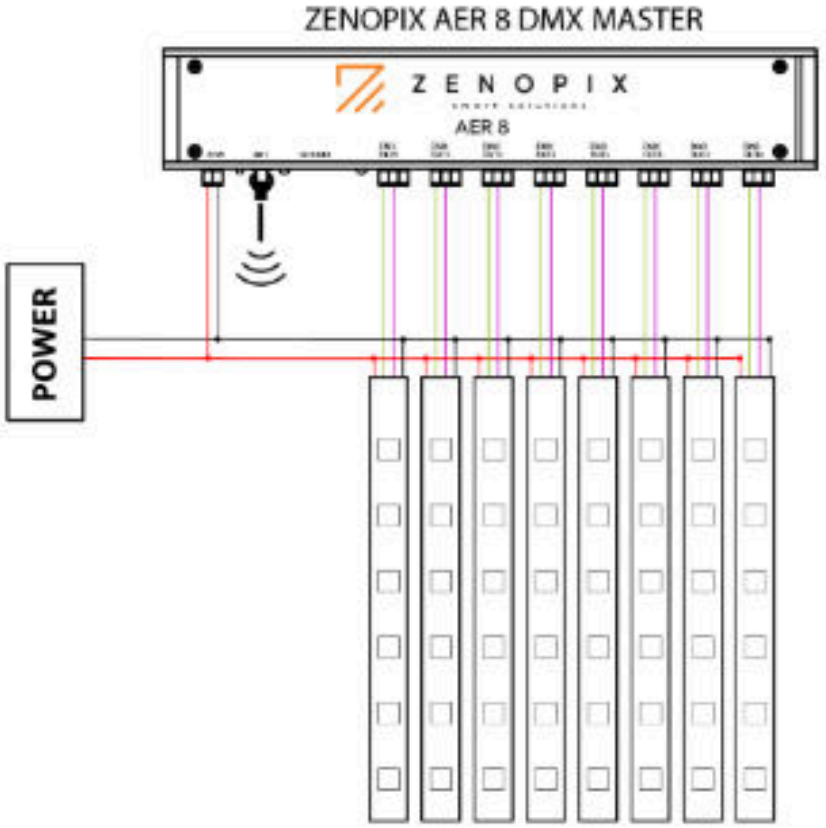


Standard Connection with SD Card



Network Connection via Wi-Fi


Wireless Router


ZENOPIX AER 8 DMX MASTER
ZENOPIX
AER 8
POWER

DMX or SPI Connection

When making DMX connections, 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). Never use a Star topology on the DMX line. Make cable connections between terminals carrying the same name label *¹. Using cables manufactured specifically for RS485 is recommended *². Do not route DMX signal lines near power lines carrying high voltage or high current (for example, asynchronous motor supply cables). For a healthy signal, terminate the DMX line at the last device with a 120 Ω resistor connected across DMX Data+ and DMX Data-. Extending your DMX cables beyond 100 meters without a repeater is not recommended.

The Zenopix Aer has 8 SPI output ports without a clock signal; the AER has no SPI clock output. Connect pin 3 (SPI Data) on the AER to the LED strip's data input (DIN), and connect the AER and LED strip grounds together. In SPI systems, the GND references of the systems must always be common. For LED strips with a backup data input, follow the strip manufacturer's wiring instructions for the main and backup data inputs. For more details, refer to the user manual of the LED strip you are using. Using shielded and twisted-pair cable is recommended. A Zenopix DMX-SPI repeater can be used to preserve signal characteristics over long cable runs.

*¹ Cable labeling may vary between manufacturers. On Zenopix and general standard products, the DMX Data + (D+ or DP) pin corresponds to pin A, and the DMX Data- (D- or DN) pin corresponds to pin B. This may differ for some manufacturers. If the products receive no signal, you can swap the cables.

*²**Recommendation:** Recommended Belden-brand cables for DMX are listed below. Check that any alternative cable you purchase has 120 ohm impedance and is twisted-pair. If the cable will be used outdoors, choose cables with high UV resistance.

Application Area	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

Power Connection

AER Device power:

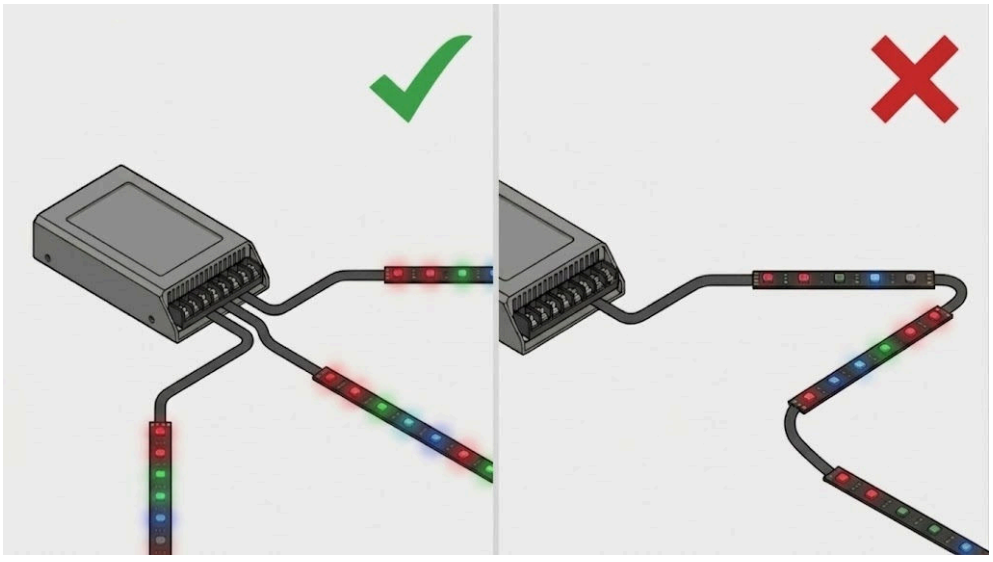
The device can operate on 12-24VDC. The terminal block version accepts DC input in either polarity. Be careful when making the power connection. The device's power input connector may vary according to customer request.

Depending on the device version: with the XLR connector version, you can use the device with the adapter supplied in the box. For the XLR version, power input is provided via a standard 2.1mm barrel jack.

With the terminal block version, you can connect the DC supply in either polarity. The device will automatically detect the polarity and operate.

Recommendation: Recommended power supplies for panel/DIN-rail applications: Mean Well HDR-15-24, DRC-24V015W1RZ or Omron S8VK-G01524.

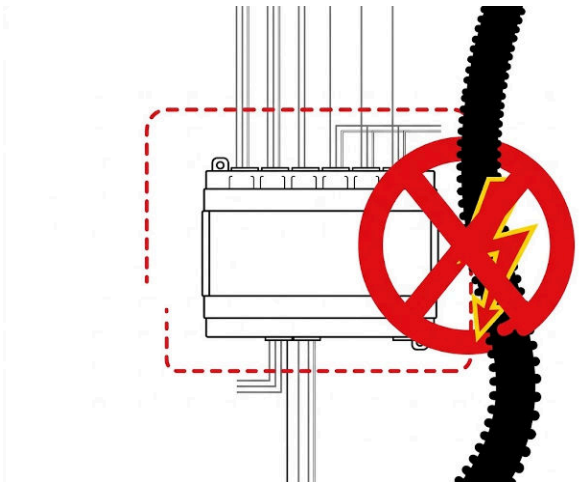
Warnings on LED Power Connections



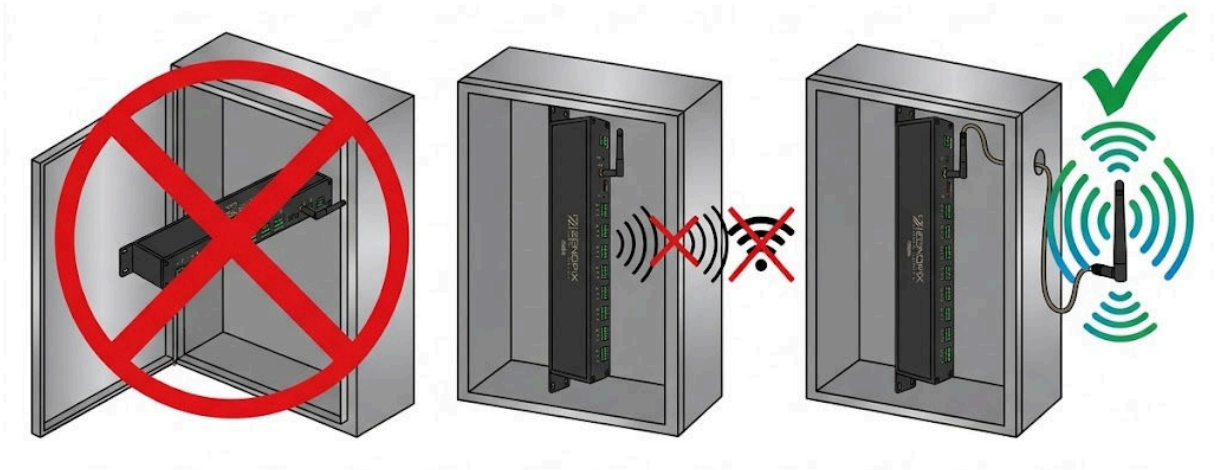
In high-current applications (>5A), it is recommended to power your LED segments directly from the power supply and distribute power using a star topology. When doing this, you must still carry the data in a daisy-chain arrangement.

Especially in flex LED applications, it is recommended to power the LEDs from both ends to prevent fading/color temperature shift in white colors at the ends of the LEDs caused by voltage drop. For more details, refer to the user manual of the LED you are using.

Installation and Precautions



For stable operation of the Zenopix AER, route signal cables away from high-voltage or high-current power cables. Routing high-current/high-voltage cables near the device body or terminal connections may cause fluctuations in the output signals or permanent damage to the hardware. Keep power cables away from the controller and its terminals. SPI lines in particular are much more sensitive to noise than DMX.



Do not place the device's antenna inside fully enclosed metal panels or enclosures. Since the device communicates over Wi-Fi, metal enclosures will block radio frequency signals by creating a Faraday cage effect. This prevents remote access to the device. ABS or polycarbonate plastic enclosures can be preferred for installations.

In rack cabinet applications, it is recommended to bring the device's antenna outside the enclosure using an extension cable so that the device can receive a signal.

Configuration via Web Browser

You can easily configure the Zenopix AER using its built-in web configuration interface. For this, the AER and your computer must be on the same network. You can configure your AER device over Wi-Fi in two different ways:

1. Configuration via Wireless Access Point (Access Point Mode)

By default, the AER device is initially set up as a standalone Wi-Fi access point. The default Wi-Fi name is ZenopixAer8 and the password is **zenopix123**. This password is public and provided as a default. Please change this password after installation. Connect your computer to the Wi-Fi network named ZenopixAer8 by entering its password. Enter the IP address **192.168.4.1** in your web browser to connect to the device's web interface.

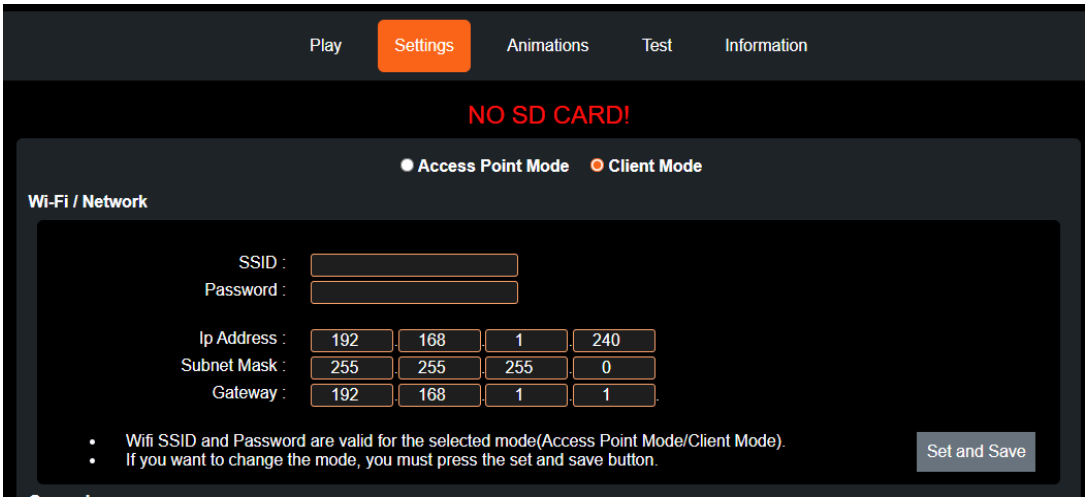
Note: You can download detailed configuration information for the web interface from www.zenopix.com.

2. Configuration via Your Existing Wi-Fi Network (Client Mode)

First, connect to the device's web interface in Access Point mode. From the “Settings” section of the web interface, you can switch your device to Client Mode and add it to an existing network. You can then access it over that network. In Client Mode, the device's default address is **192.168.1.240**.

Follow the steps below to configure the device:

- Connect your computer to the ZenopixAer8 network and open 192.168.4.1 in your browser.
- Open the web interface and go to the Settings menu.
- Switch from Access Point mode to Client mode.
- Enter the name and password of the Wi-Fi network you want to connect to in the SSID and Password fields (at least 8 characters).
- Default settings
  - IP address: **192.168.1.240**
  - Subnet mask: **255.255.255.0**
  - Gateway: **192.168.1.1**



- You can change these values to suit the network you want to connect to. The device does not obtain an IP address automatically. Assign the AER a static IP address on the same subnet as the target network, and use an address that is not already in use.

- Press the Set and Save button. The device restarts. Connect your computer to the same Wi-Fi network and enter the device's IP address in your browser.

When joined to an existing network, the default IP address is 192.168.1.240.

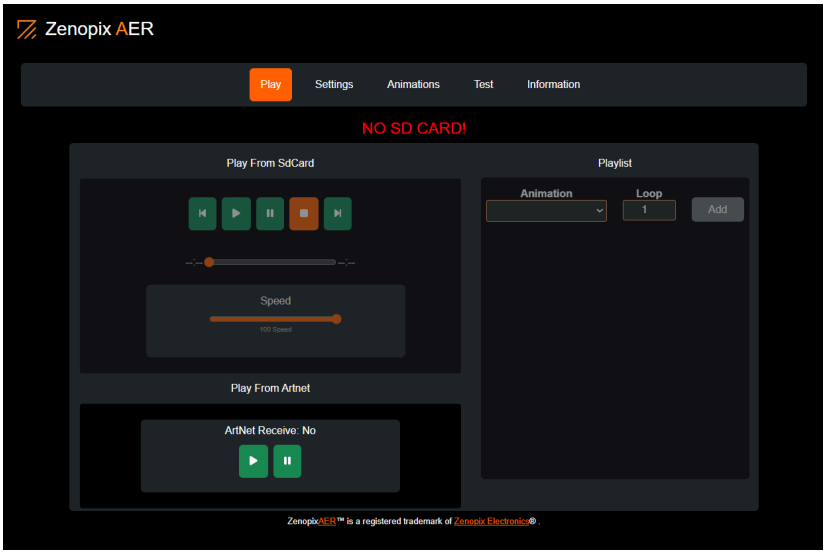
Default IP Address when used as a Wireless Access Point: **192.168.4.1**.

If you cannot access the device: You can restore factory settings by pressing and holding the reset button on the device's front panel for 10 seconds. The device restarts in Access Point Mode. In addition to the Wi-Fi settings, this also restores the device name, LED type and port addresses to their factory values.

Other Menus of the Web Interface

1. Play Menu

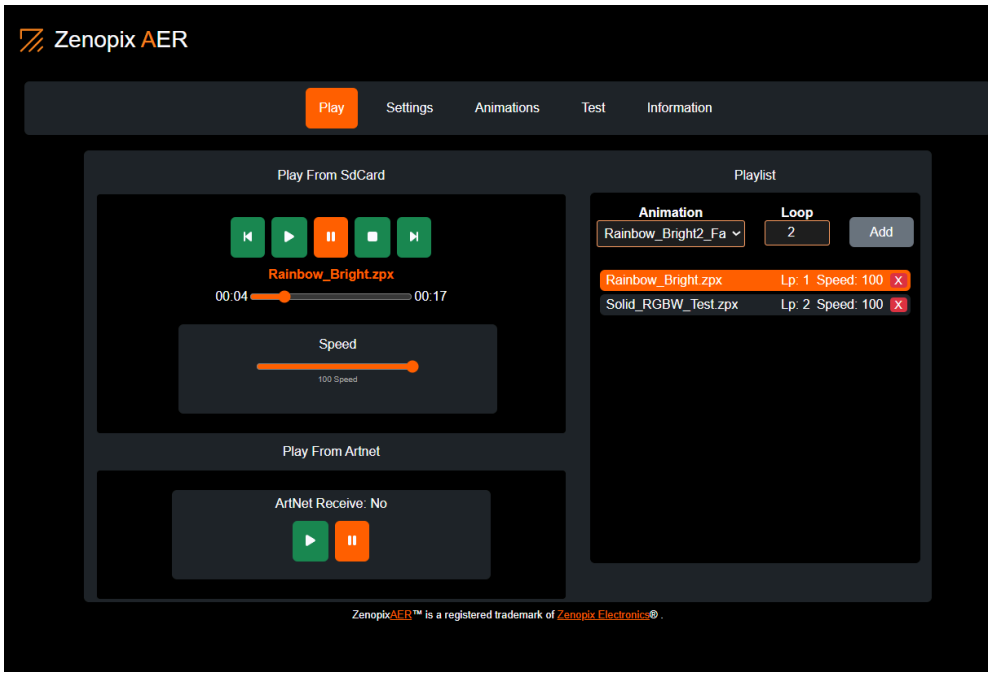
The Play menu is used to play animations on the SD card, edit the playlist and monitor incoming Art-Net data. The menu consists of three sections: Play From SdCard, Play From ArtNet and Playlist.



When you start Art-Net playback, SD card playback stops. When you start SD card playback, Art-Net is paused. The two do not run at the same time.

If an animation is removed from the playlist, the list restarts from the beginning and a "Playlist restarted..." warning appears at the top of the screen. This does not delete the file from the SD card.

SD card warning: If there is no SD card in the device, a red NO SD CARD! message appears at the top of the screen. The SD playback buttons do not work until an SD card is inserted.



2. Settings Menu

The Settings menu is where the device's network connection, name, LED type and output port addresses are set. Each section has its own Set button. Changes made in a section are not saved until you press that section's button.

Wi-Fi / Network

Access Point Mode: The device broadcasts its own Wi-Fi network. This is the factory setting.

Client Mode: The device connects to your existing Wi-Fi network.

SSID / Password: These belong to the selected mode. In Access Point Mode, they are the name and password of the network the device will broadcast (default password in Access Point mode: **zenopix123**); in Client Mode, they are the name and password of the network to connect to. The SSID and password must be at least 8 characters.

IP Address / Subnet Mask / Gateway: The device's static address and network information. The device does not obtain an address automatically.

Press the Set and Save button to save the change. The device restarts itself and you will need to reconnect.

General – Device Name

This is the device name shown on the network and in Art-Net software. It can be up to 17 characters. To change it, type the name and press Set. Use only A–Z, a–z, digits, underscores (_), hyphens (-), spaces, and periods (.).

Settings > Led Type

Selects the protocol of the LEDs connected to the device (DMX512, WS2811, WS2812, WS2812b, WS2813, WS2815, SK6812, TM1829, UCS1903, etc.). LEDs will not work properly unless the correct protocol is selected. When you press Set, the selection is applied and saved immediately; there is no need to restart the device.

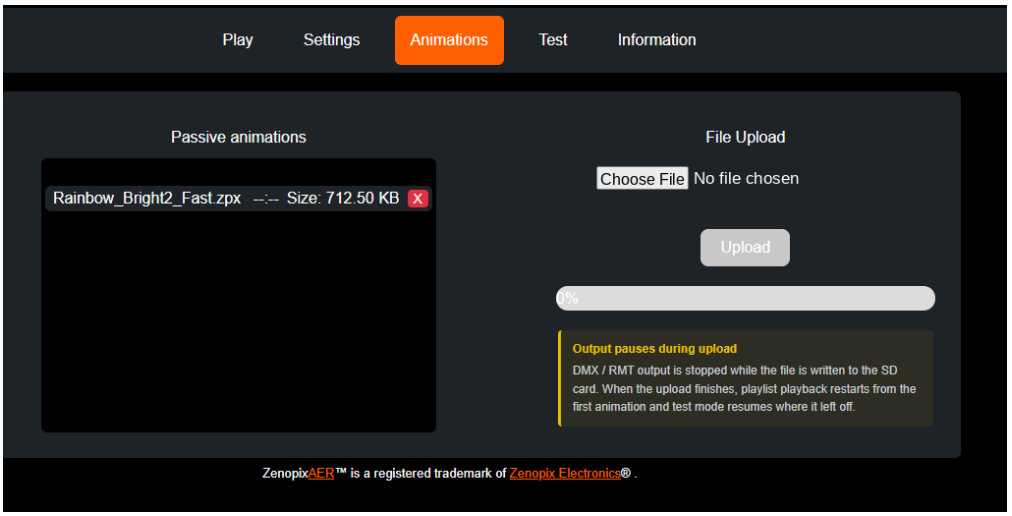
Port Addresses (8 output ports)

An Art-Net universe number (1–32767) is entered for each of the device's 8 output ports. Incoming Art-Net data and the animation files on the SD card are routed to the corresponding port according to this number. In the

factory setting, Port-1...Port-8 are set to universes 1...8 respectively. To change them, type the numbers and press Set.

3. Animations Menu

In the Animations menu, you can view and delete the animation files on the SD card and upload new animations to the device. The menu consists of two sections: Passive animations and File Upload.



Passive animations

Shows animation files that are on the SD card but have not yet been added to the playlist (the Playlist in the Play menu). Each row shows the file's name, duration and size.

The X button on the right of a row permanently deletes the file from the SD card. This cannot be undone.

File Upload

Lets you upload an animation file from your computer directly to the device's SD card.

Animation files (.zpx) are created with the Zenopix NEO or Zenopix ECHO Art-Net Recording software; see the manual of the relevant software for details.

Press the Choose File button and select the animation file with the “.zpx” extension from your computer.

Press the Upload button.

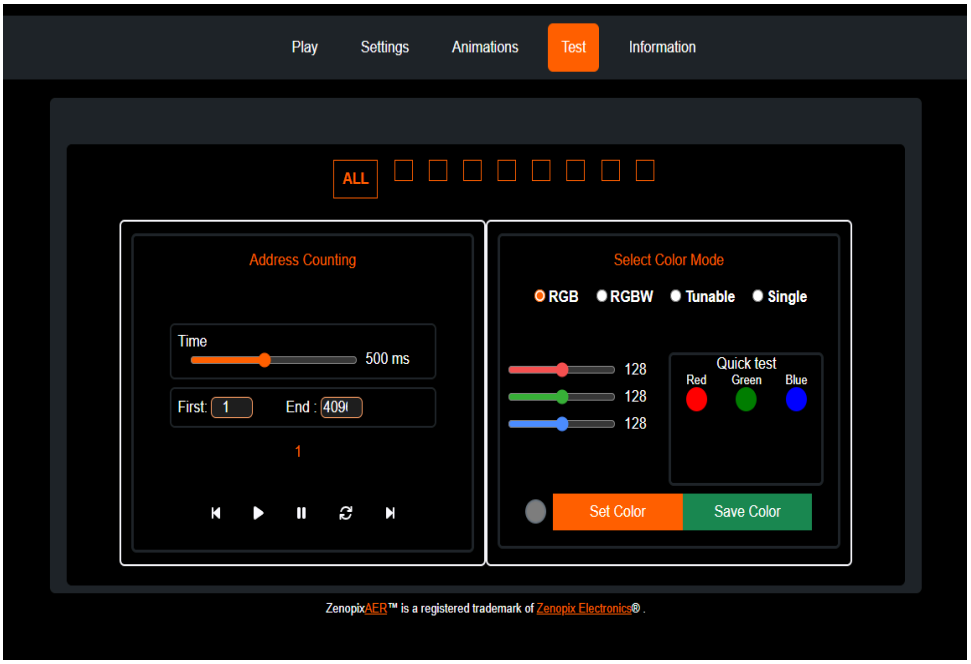
Wait until the progress bar reaches 100% and the "File uploaded successfully!" message appears.

The uploaded file appears in the Passive animations list. To play it, add it to the list from the Play menu.

Caution: The device's output (DMX / SPI) stops during upload. When the upload is complete, the playlist restarts from the first animation, while test mode resumes where it left off. Do not close the page or remove the SD card before the upload is complete.

4. Test Menu

The Test menu is used to test the LEDs and wiring connected to the output ports. It consists of two sections: Address Counting on the left, and Select Color Mode and color settings on the right.



Selecting the ports to test

Tick the ports you want to test using the boxes at the top of the menu. Each box shows that port's universe number. ALL selects all of them at once. The test is applied only to the ticked ports.

Address Counting

The test activates one channel at a time on each selected port, then advances to the next channel. This lets you see step by step which channel is connected to which LED.

Time: Wait time between each step (100–1000 ms).

First / End: The first and last address to count (1–4096).

Select Color Mode

Select a mode according to the channel structure of your LEDs: RGB, RGBW, Tunable (2 channels) or Single (single channel). The relevant color sliders are shown according to the mode you select.

Use the sliders to set the value of each channel between 0–255.

You can quickly send a single color by clicking the Red / Green / Blue (White in RGBW mode) boxes under Quick test.

Set Color: Sends the color to the selected ports immediately.

Save Color: Sends the color and saves it to the device. If the playlist on the SD card is empty (or no SD card is inserted), this color remains on the output when the device restarts.

Caution: When a test is started, playback from the SD card stops. To return to normal playback, press the ▸ button in the Play menu.

5. Information Menu

The Information menu displays your device's identification information and lets you perform software updates.

Device information

Serial Number: The device's serial number

Model Number: The device's model number

Mac Address: The device's network (MAC) address

Hardware Version: Hardware version

Software Version: Software (firmware) version installed on the device

Software Update

You can update the device's software from the web interface. This requires the device to be connected to the internet. In Client Mode, connect the AER to a Wi-Fi network with internet access (see Settings menu). Updates cannot be performed in Access Point Mode; the warning "Please connect the device to the internet!" appears on the screen.

Open the Information menu. Click the refresh icon (🔄) below the Check For Updates label.

The device checks for the latest version. The result will be one of the following:

- Software up to date! Your software is up to date; no action is needed.

- New Version Available (x.y.z) Update Now: A new version is available. Click the download icon (⬇).

- Could not check latest software version: The version information could not be retrieved. Check your internet connection and try again.

Once the update starts, the progress percentage is shown on the screen. During this time, do not cut power to the device or close the page.

When the process is complete, "Update completed successfully. Restarting..." is displayed and the device restarts. After the device starts up, you can see the new software version in the Information menu.

If you see "Update error", the update has not been completed. Check your connection and try again.

Controlling the AER with Zenopix NEO

Zenopix NEO is desktop software with which you can both send Art-Net output to your devices and record animations for the AER device. It is tailored for all online and offline devices developed by Zenopix, the Aer in particular. If you will use this software with the AER in online mode, the AER must have joined a network as a client.

The recommended range for DMX is 1-512 channels. However, you can go up to 1,024 channels (the frame rate drops). The recommended range for SPI is 1-3,072 channels. However, you can go up to 4,096 channels (the frame rate drops).

With the AER, you can easily carry out complex, multi-channel projects. The most flexible aspect of this device is that you can save your ready-made animations to the SD card and use them offline.

To create a project tailored for the Aer in NEO, simply select Patch->New Patch from the main screen menu and choose the Aer8 or Aer6S device as the project parameter on the screen that appears.

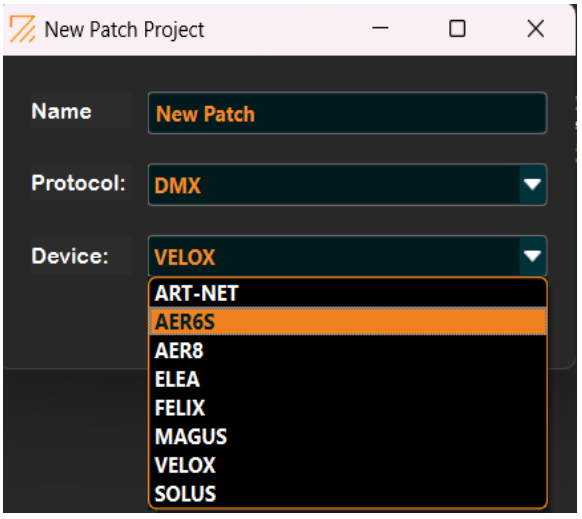


Figure: Adding the AER to Zenopix NEO

Then, on your Patch screen, configure your Zenoverses according to the AER device you have configured.

With this information, click the “Add Zenoverse” option on the patch screen that appears, select the target group on the next screen and complete the configuration for your device.

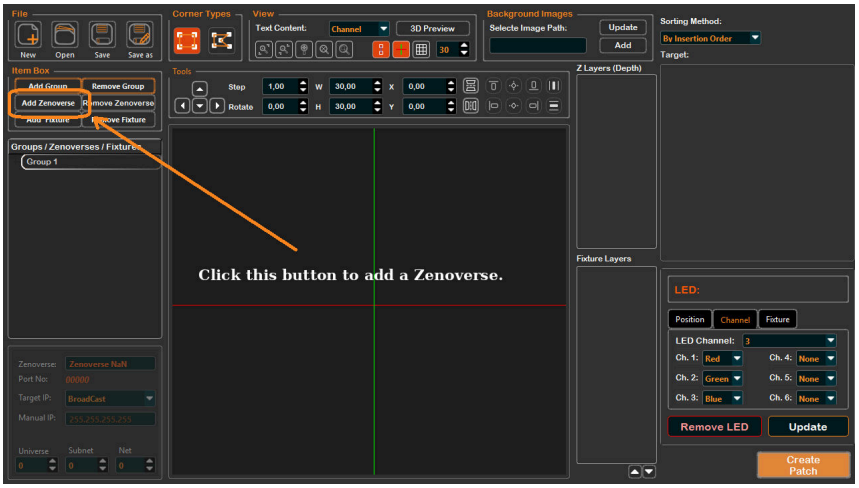


Figure: Adding multiple universes (ports) to Zenopix NEO

“Single Addition” is the default option, but with the “Multiple Addition” option you can add all ports at once. You only need to know the start and end Universe numbers. When configuring ports and universes in Zenopix NEO (with Multiple Addition or port ranges), the range 1-8 (8 ports/universes in total) is generally used for the AER.

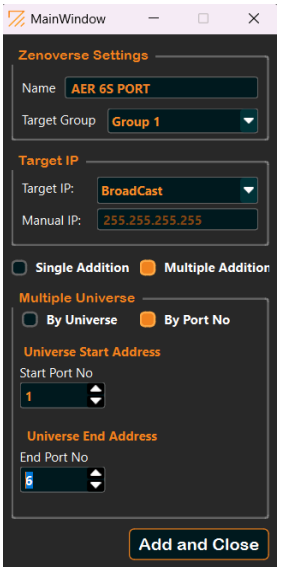


Figure: Adding multiple universes (ports) to Zenopix NEO and assigning an IP address

After configuration, when you add the Zenoverses you should see the port outputs on the Patch screen. Here you can change all parameters of the ports individually if you wish.

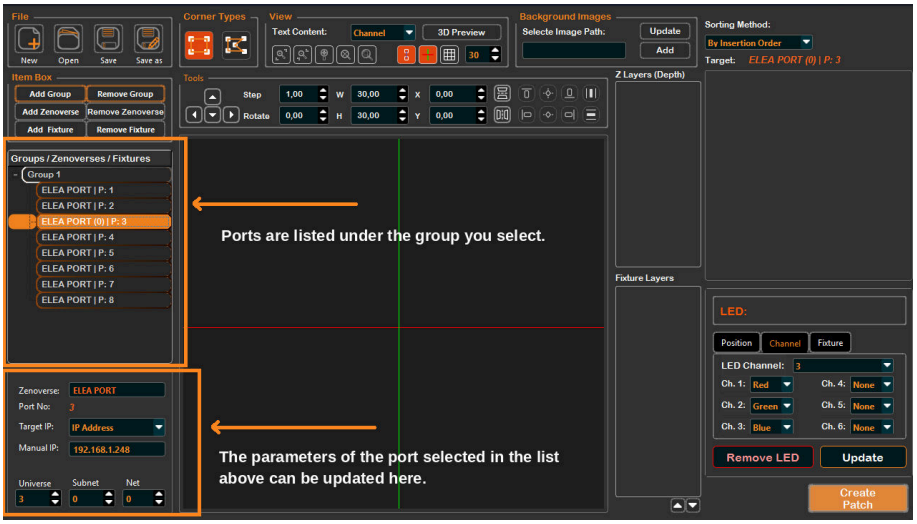


Figure: Managing universes (ports) in Zenopix NEO

The AER's ports and universes are now configured in Zenopix NEO. You can now move on to designing your project.

Once the project design is finished, open the “Art Net” panel on the main screen to enable Art-Net output.



Figure: Enabling Art-Net output in Zenopix NEO

In the panel that appears, select the computer's network adapter connected to the same network as the AER (Ethernet, Wi-Fi ...), then enable Art-Net output. Your device will then receive data from your computer for real-time control.

Connection with Third-Party Software

Getting the images and animations you want with the Zenopix AER is very easy. The AER receives Art-Net data over Wi-Fi from compatible third-party lighting control and media software, such as MADRIX, Resolume Arena and Jinx!, so the visuals you create are transferred to your LEDs in real time.

Warnings

1. Products must be installed by qualified professionals.

2. Zenopix products are not waterproof (except for special models). Please avoid sun and rain. When installed outdoors, please make sure it is mounted inside a waterproof enclosure. Good heat dissipation will extend the service life of the products. Please provide good ventilation.

3. Please check that the operating voltage used meets the parameter requirements of the products.

4. Use a wire size suitable for the connected fixtures' current draw, and ensure all terminations are secure.

5. Before applying power, verify that all cables are connected correctly; 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.

6. 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 using the Zenopix Aer or about technical issues, use the following resources for troubleshooting:

- Read the Zenopix Aer 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)

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

-If the line is DMX: a missing 120 Ω termination resistor at the end of the DMX line.

-The power supply being unable to provide sufficient current.

-Non-standard wiring or exceeding the maximum signal transmission distance. Note: 80-100 meters for DMX, 10-30 meters for SPI depending on the LED type

-Errors originating from the animation.

Does the device support RDM?

-No, the AER device does not support RDM.

How should I choose between DMX and SPI LEDs?

This choice depends on the scale and budget of your project and on environmental factors:

DMX LEDs: Although relatively more expensive, they have strong immunity to electrical noise. They are ideal for professional and architectural

applications that require long cable distances between the controller and the LEDs. A failure of one LED/fixture generally does not affect the other LEDs/fixtures. Each end device is independent of the others.

SPI LEDs (WS2812, etc.): They are generally more cost-effective and can offer higher pixel density. Due to their data transmission structure, they do not require external addressing. However, SPI LED data lines are more susceptible to electrical interference, so use them for shorter cable runs. If part of an SPI LED run fails, everything after the failed point stops working (except special series).

Order Code

PRODUCT CODE	AER	8	CT	TB
Capacity				
8 Universes Output		8		
Enclosure Type				
Cabinet Type			CT	
Connection				
Pluggable Terminal Block				TB
XLR Connector				XLR

Your lighting solution partner

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

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