ZENOPIX smart solutions

Your Solution Partner in Lighting Control

VELOX

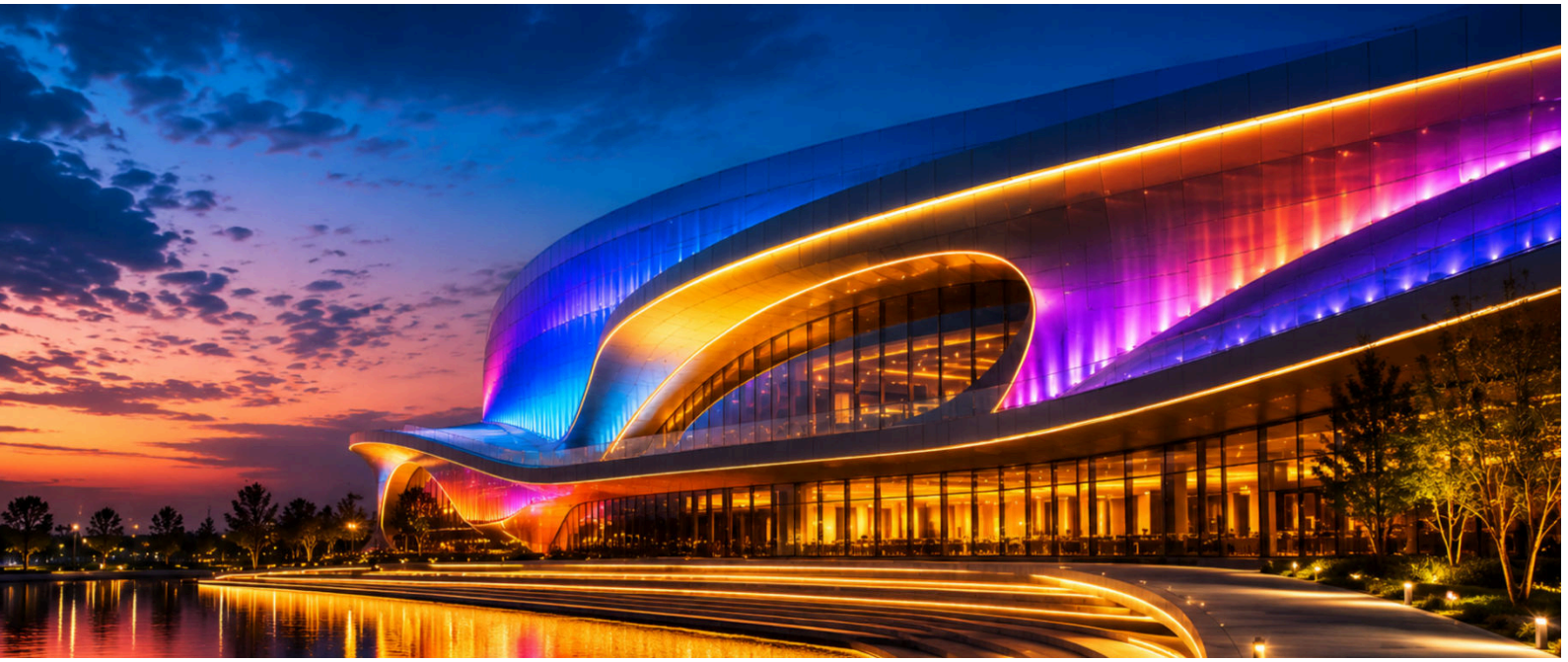
ONLINE ART-NET SPI CONTROLLER

USER MANUAL



Version 3 / October 2026

zenopix.com



Thank you for choosing Zenopix VELOX.

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.

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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

Zenopix Velox comes with a standard 2-year manufacturer's warranty, with an optional 3-year extension for a total of 5 years. Detailed information is available in the product warranty certificate or on our website.

Box Contents

1× Zenopix VELOX

2× 1*3 Female Terminal Block

1× 1*2 Female Terminal Block

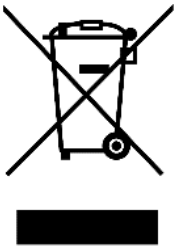
1× User Manual

1× Warranty Certificate

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

Zenopix VELOX is an online SPI controller that converts Art-Net data for LED drivers with SPI chips. It transmits animation data from a computer or a Zenopix Solus device to LEDs with SPI ICs. It can be configured and controlled quickly from the web interface. Transmitting lighting data at high speeds over Ethernet, Velox is fully compatible with all Art-Net-capable software, including **Zenopix NEO**, Jinx, Madrix, Resolume Arena and Enttec LED Mapper (ELM).

The device supports up to **3072** channels per port (6144 channels / 12 universes in total) on **two** independent **SPI output ports**.

- **Dual-Port SPI Output:** Converts Art-Net to SPI with up to 3072 channels per port and manages 6144 channels (12 universes) in total.
- **Wide IC Compatibility:** Provides direct support for a wide range of SPI LED driver ICs.
- **Embedded Web Server:** Quick configuration of IP, universe and IC settings from any standard web browser.
- **Software Independent:** Plug-and-play compatibility with all Art-Net software and consoles (**Zenopix NEO**, Madrix, Resolume, etc.).
- **DIN-Rail Enclosure:** Fast and secure mounting in electrical panels.
- **Real-Time Status LEDs:** Built-in indicators for real-time monitoring of network connection and data traffic.

Safety Instructions

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

⚠️	This device operates at low voltage (12-24VDC). Do not use lower or higher voltages.
⚠️	External USB Power Supplies: Using unapproved units may pose a risk. Please do not use the USB port on the device to supply power to external devices.
⚠️	Any external power supply to be connected to the device 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.

Technical Specifications

Input Voltage Range	12-24VDC (Adapter or Terminal)
Power Consumption	<8 W (during normal operation)
Network Protocol	Input: Art-Net 4. Output: SPI.
Number of SPI Universes	12 universes in total (maximum 6 universes per port), maximum 2 x 3072 channels
Maximum FPS	Maximum 30 FPS for 3072 channels
SPI data rate	~800 kHz
Output Ports	3-pin, 5.08 mm terminal block (DATA, CLOCK, GND)
Status LEDs	6
Ethernet	1x RJ45, 10/100 Mbit/s
USB	1x Port, USB 2.0, Type-B Socket (for updates)
Enclosure	Plastic DIN-rail enclosure
Dimensions (Rail Type)	105.14 – 103.12 – 57.04mm (L x W x H)
Weight	160g
Operating Temperature and Humidity	0°C ~ 60°C / 20 ~ 70% RH, Non-Condensing
Storage Temperature and Humidity	-10°C ~ 70°C / 0~ 70% RH, Non-Condensing
Protection Class	IP20
Certificates	CE, RoHS
Supported SPI LED Drivers	41 different IC models
Data Loss Options	Release Line, Hold Blackout, Hold Last Look
Configuration and Update	Built-in web interface, firmware update over the internet

Supported LED Protocols

Select one of the following 41 LED protocols from the LED Type list; the selection applies to both LED outputs. Check the driver name on your LED product or in its product information.

Protocol Family	Selectable LED Drivers
APA and PL	APA102, APA104, APA106, PL9823
WS	WS2801, WS2803, WS2811, WS2812, WS2812b, WS2813, WS2818, WS2852, WS2815
SK	SK6812, SK6822, SK9822
UCS	UCS1903, UCS1903B, UCS1904, UCS1909, UCS1909B, UCS2903
TM and MT	TM1803, TM1804, TM1809, TM1903, TM1934, TM1914, MT16703
MY	MY9221, MY9231, MY9291
LPD	LPD6803, LPD8806, LPD1886
Other	GE8822, GS1903, GW6205, MBI6120, SM16703, SM16716

Note: For single-wire chips such as WS2812, leave CLOCK unconnected.

Status LED Codes

- **POW:** This is the power LED. It lights up when power is connected to the device.
- **USB:** Lights up when a USB connection is made.
- **SPI1 and SPI2:** Light up when data is sent to the output ports.
- **LNK:** Lights red when there is no Ethernet connection.
- **POL:** Blinks red when there is no connection, then green.

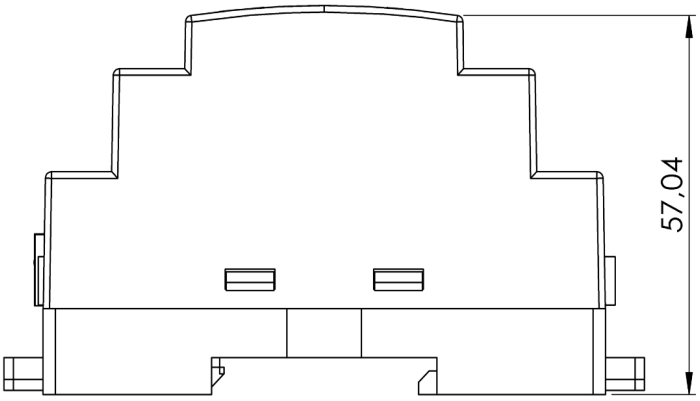
Resetting to Factory Settings with the Reset Button

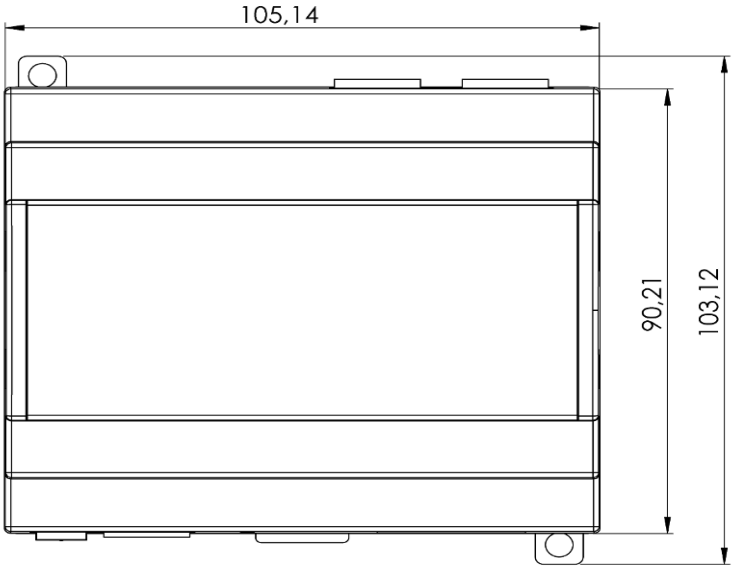
1. If another device uses the same factory IP address, temporarily unplug the Ethernet cable to avoid an IP conflict.
2. While the device is running, press the reset button on the front panel with a suitable thin-tipped tool.
3. Hold the button for at least 5 seconds. If released earlier, the factory reset does not start.
4. Release the button when the connection status LED starts blinking rapidly. The device deletes the user settings, saves the factory values and reloads the network settings.
5. Plug the Ethernet cable back in. The current browser session ends; put the computer on the same subnet as the factory network below and reconnect at 192.168.1.130.

Default Values Loaded on Factory Reset

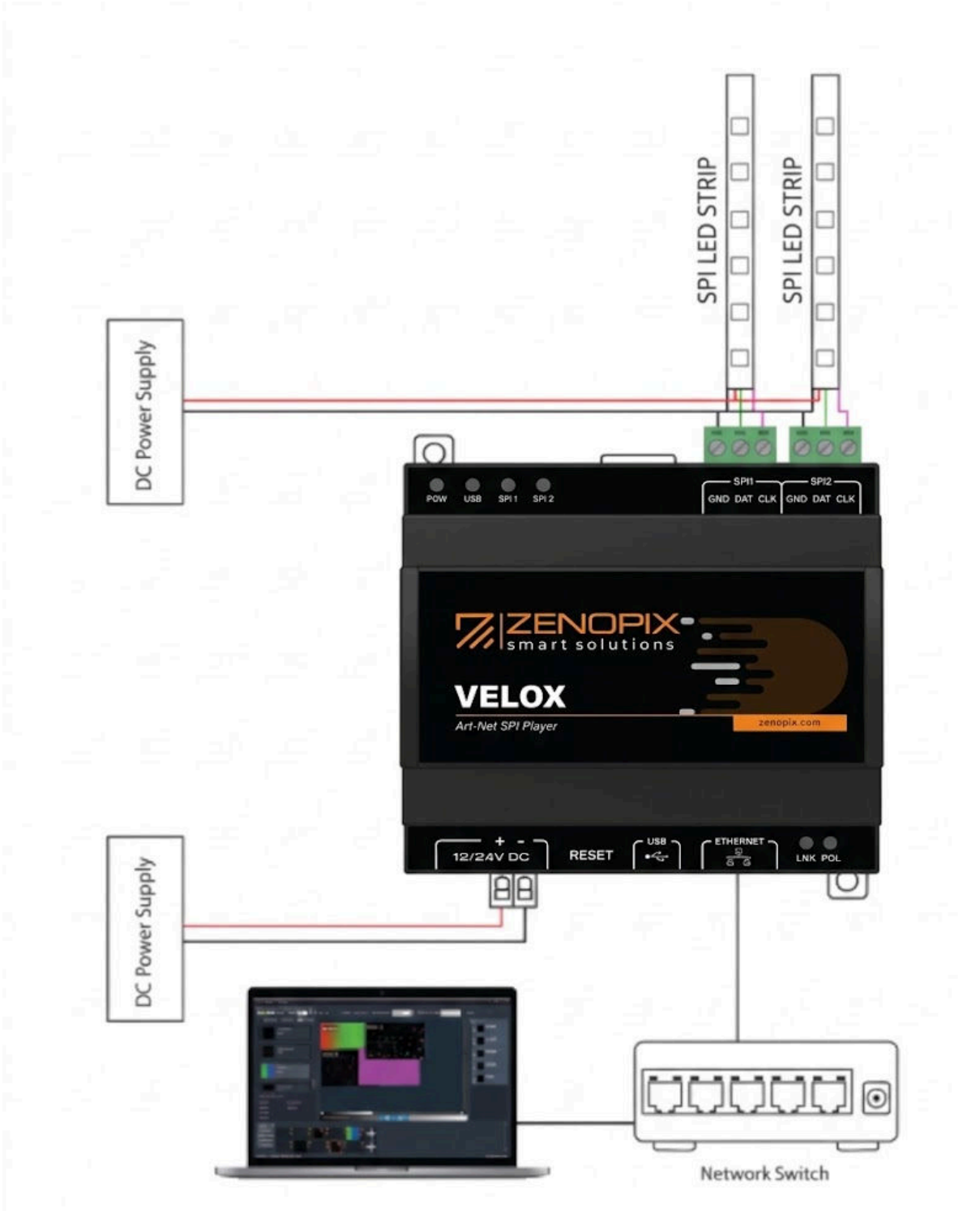
Setting	Factory Value
Network	IP 192.168.1.130, mask 255.255.0.0, gateway 192.168.0.1
Device	Name Zenopix Velox, LED type WS2812b, data loss option Release Line
Port 1	By default, 5 active Universes, Global Universe 1-5, channel length 512. If 6 universes are selected, the global universe range is 1–6.
Port 2	5 active Universes, Global Universe 7-11, channel length 512. If 6 universes are selected, the global universe range is 7–12.
Test	ARTNET MODE, counter 1-512, step time 1000 ms, 3 channels

Device Dimensions





Device and Pin Connections



SPI Connection

Zenopix Velox has 2 SPI output ports. Each of these SPI outputs provides a data and a clock output. When connecting SPI LEDs to Zenopix Velox, match the LED pin labels to the corresponding terminal labels. If your LEDs have an additional data pin (for example, the Backup Control data pin on the WS2815), you can tie it to the LED's main data input pin and use the two pins as a single data input. All devices in an SPI system must share a common ground (GND). For more details, refer to the datasheet of the LED strip you are using. Extending the SPI signal beyond 10-15 meters is not recommended. Shielded, twisted-pair cable is recommended.

Power Connection

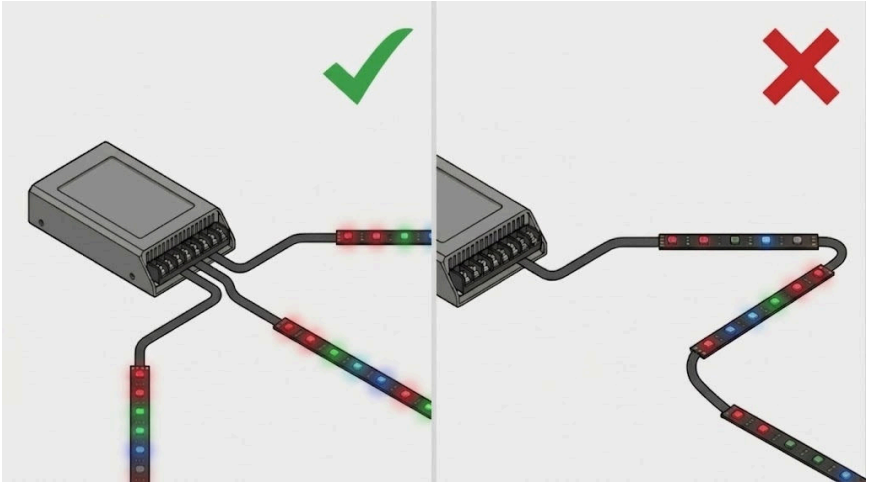
Device power:

The device can operate at 12-24VDC. The device has reverse-polarity protection, but be careful when installing the device.

The device has two power inputs: a 2.1mm barrel jack and a 5.08mm terminal block. Do not power the device from both at the same time; one connection is sufficient. Use an adapter of at least 12W (for example, 24V >=0.5A).

Recommendation: For panel/rail applications, the following power supplies are recommended: Mean Well HDR-15-24, DRC-24V015W1RZ or Omron S8VK-G01524.

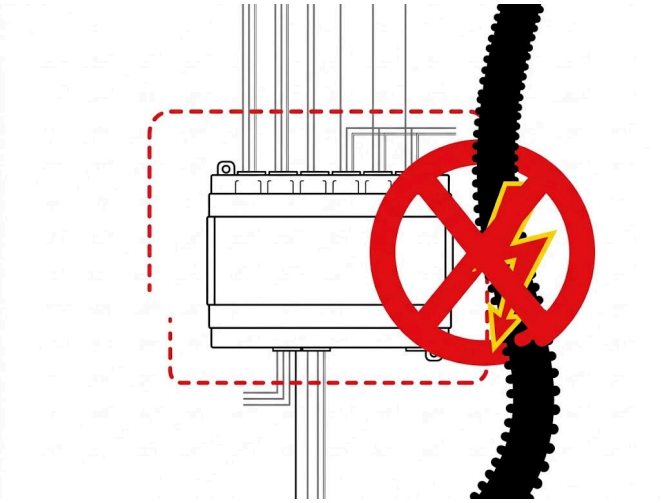
Warnings about LEDs:



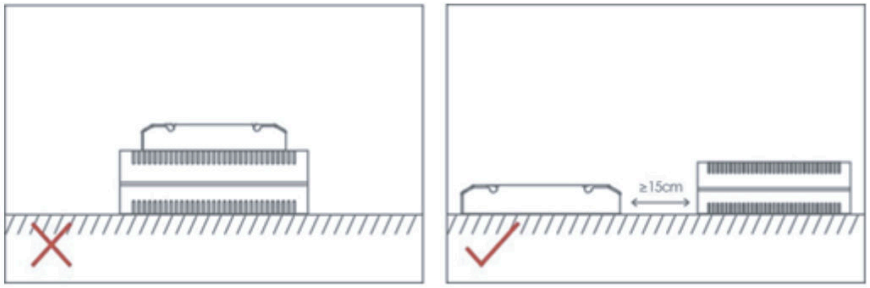
In high-current applications (>5A), it is recommended to power your LED segments directly from the power supply and distribute the power in a star topology. When doing this, the data must still be carried in a daisy-chain arrangement.

Especially for flexible LED installations, we recommend powering the LEDs from both ends to prevent voltage drop from dimming the white light or shifting its color temperature at the ends.

Installation and Precautions



Isolation of the signal lines is critical for stable operation of the Zenopix Velox device. 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. Isolate the device from high-current and high-voltage cables. Remember that SPI lines are much more sensitive to noise than DMX lines.



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.

Configuration via Web Browser

Zenopix VELOX converts the Art-Net data it receives over the Ethernet network to the selected SPI LED protocol. Network, output, test, system and update functions are managed from the built-in web interface. The computer and VELOX must be on the same network.

Follow the steps below to configure the device:

1. Connect VELOX to power and Ethernet.

2. Give the computer an address from the same subnet as the device.

Example: 192.168.1.10 / 255.255.0.0.

3. Enter the factory Velox IP address **192.168.1.130** in the browser.

Factory network settings: IP 192.168.1.130 / Mask 255.255.0.0 / Gateway 192.168.0.1.

Web Interface and Device Management

Menu names are given as they appear in the interface. In normal operation, ARTNET MODE must be selected. When LED CONTROL MODE is active, external Art-Net data is not processed.

General Network Settings and Output Ports

• Network Configuration: Edit the IP Address, Subnet Mask and Gateway. SET NETWORK saves them to non-volatile memory and loads the new configuration.

• General Configuration: Set the Device Name (up to 17 characters), the LED Type and the data-loss behavior (shown on screen as Failsafe Mode).

• Output Port Configuration: Select 1 to 6 active Universes per LED output and assign each a Global Universe Address.

• Manual Length: Optionally set the number of channels to process for that Universe to a value between 1 and 512. APPLY PATCH saves the output mapping.

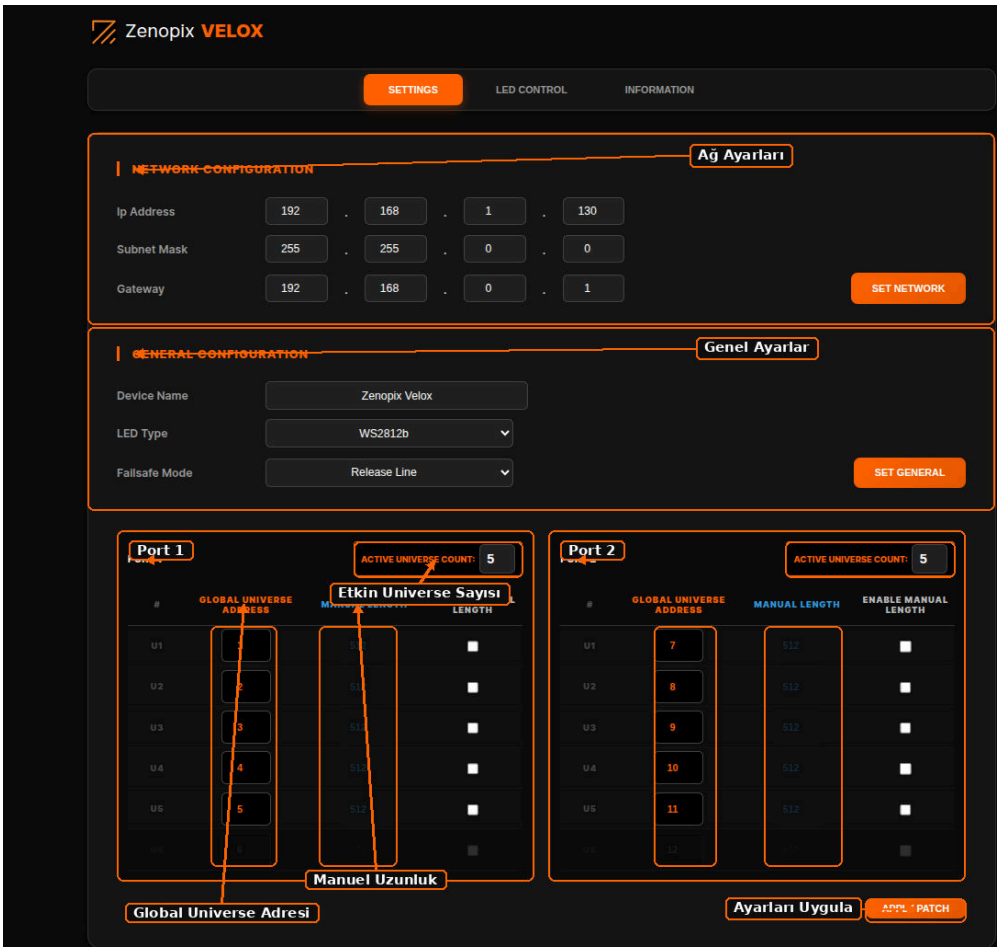


Figure: Annotated general network settings and output Universe configuration

Merging Universe Data End to End

Each LED/Port output of VELOX carries up to 3072 channels. The U1-U6 rows in the interface set the merge order, regardless of the Global Universe Address. The device appends matching Art-Net data without gaps, starting from U1.

Merge rule: SPI output = U1 data + U2 data + U3 data + ... + last active Universe data.

Example: On Port 1, U1 is Global Universe 1 with 512 channels, U2 is Global Universe 8 with its channel count manually set to 300, and U3 is Global Universe 12 with 512 channels. Global addresses need not be consecutive; the on-screen row order sets the channel order on the LED output.

Slot	Global U and Length	Channel Range on LED Output
U1	Universe 1 / 512 channels	1-512
U2	Universe 8 / 300 channels	513-812
U3	Universe 12 / 512 channels	813-1324
Result	512 + 300 + 512	1324 channels end to end

If Manual Length is off, the incoming Universe's channel length is used; if on, only the specified number of channels is taken. The total cannot exceed 3072 channels. Port 1 and Port 2 work independently.

For a clean first frame, it is recommended to send the active Universe packets regularly and in the U1-U6 row order. After changing Universe mappings, save them with APPLY PATCH.

When Art-Net Data Is Lost

• Release Line: When Art-Net data is lost, the device stops refreshing the LED output.

• Hold Blackout: When Art-Net data is lost, the connected LEDs are turned off.

• Hold Last Look: When Art-Net data is lost, the LEDs retain their last state.

The device considers the connection lost about 10 seconds after receiving the last Art-Net data and applies the selected behavior.

LED Control Mode

• ARTNET MODE: The normal operating mode. Art-Net data at the set Universe values is transferred to the SPI outputs.

• LED CONTROL MODE: Opens the manual color and channel counter tests. In this mode, the red warning bar at the top indicates that external Art-Net data is being ignored.

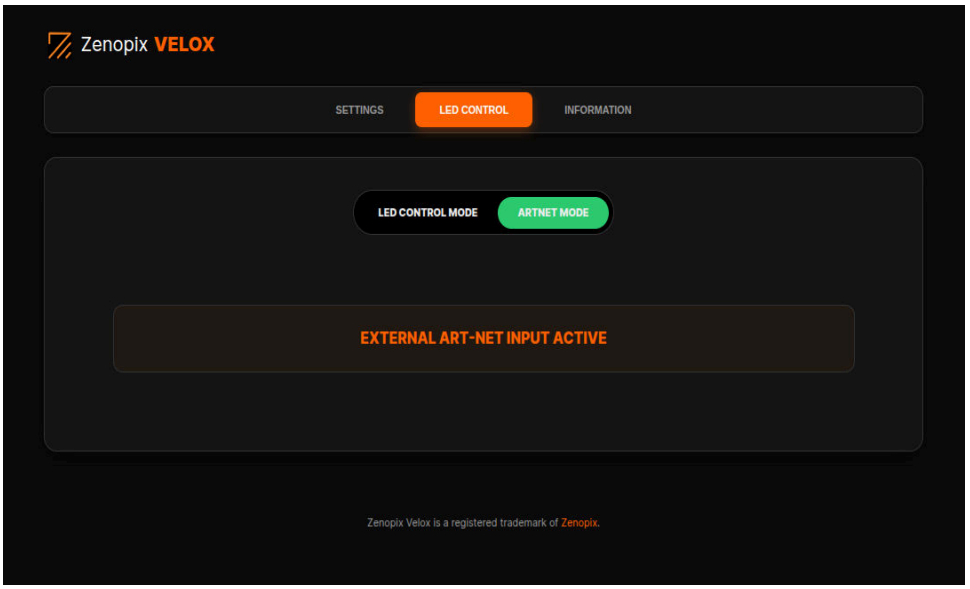


Figure: ARTNET MODE operating view

Manual Color and Output Test

1. Turn on the switch for each port you want to test (PORT 1, PORT 2 or both).

2. In the Test Scope field, select ALL UNIVERSES or SPECIFIC UNIVERSE; for the latter, set the Target U value.

3. Select the channel count using the 1-CH through 5-CH options.

4. Select the color function of each channel and set a value from 0 to 255 with the sliders.

5. The SAVE COLOR button writes the test color, port, scope and channel layout to non-volatile memory.

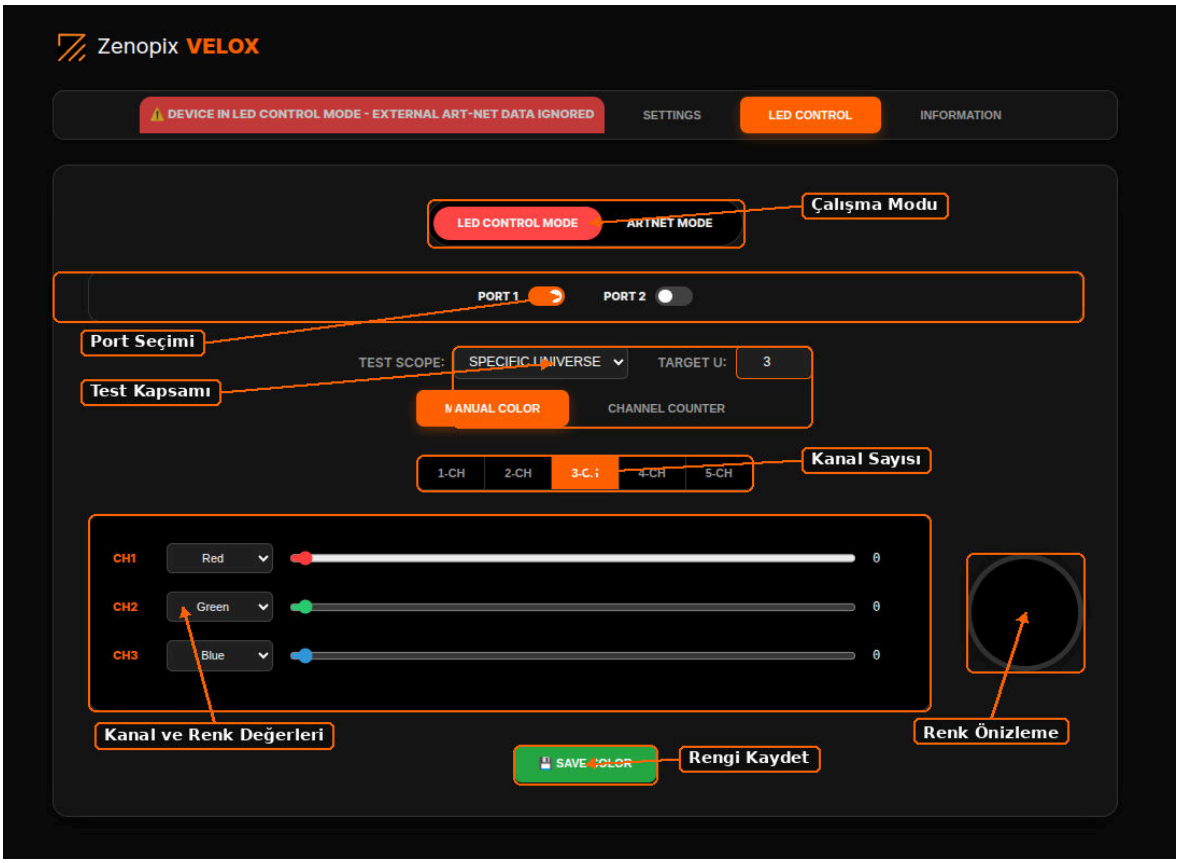


Figure: Annotated manual color and output test

When the test is complete, select ARTNET MODE. If LED CONTROL MODE is left active, external Art-Net data is not transferred to the outputs.

Channel Counting

Within the selected test scope, the counter steps from the start to the end address on the selected port, setting one channel at a time to full level. Use it to verify LED order, channel mapping and line continuity.

• Start Addr and End Addr: Test range limits, each set between 1 and 3072.

• Speed: Interval between automatic steps, set between 20 and 2000 ms.

• PREV and NEXT: Go to the previous or next channel; wrap around to the other end at the ends of the range.

• PLAY and PAUSE: Start or pause automatic stepping. STOP returns the counter to the start address.

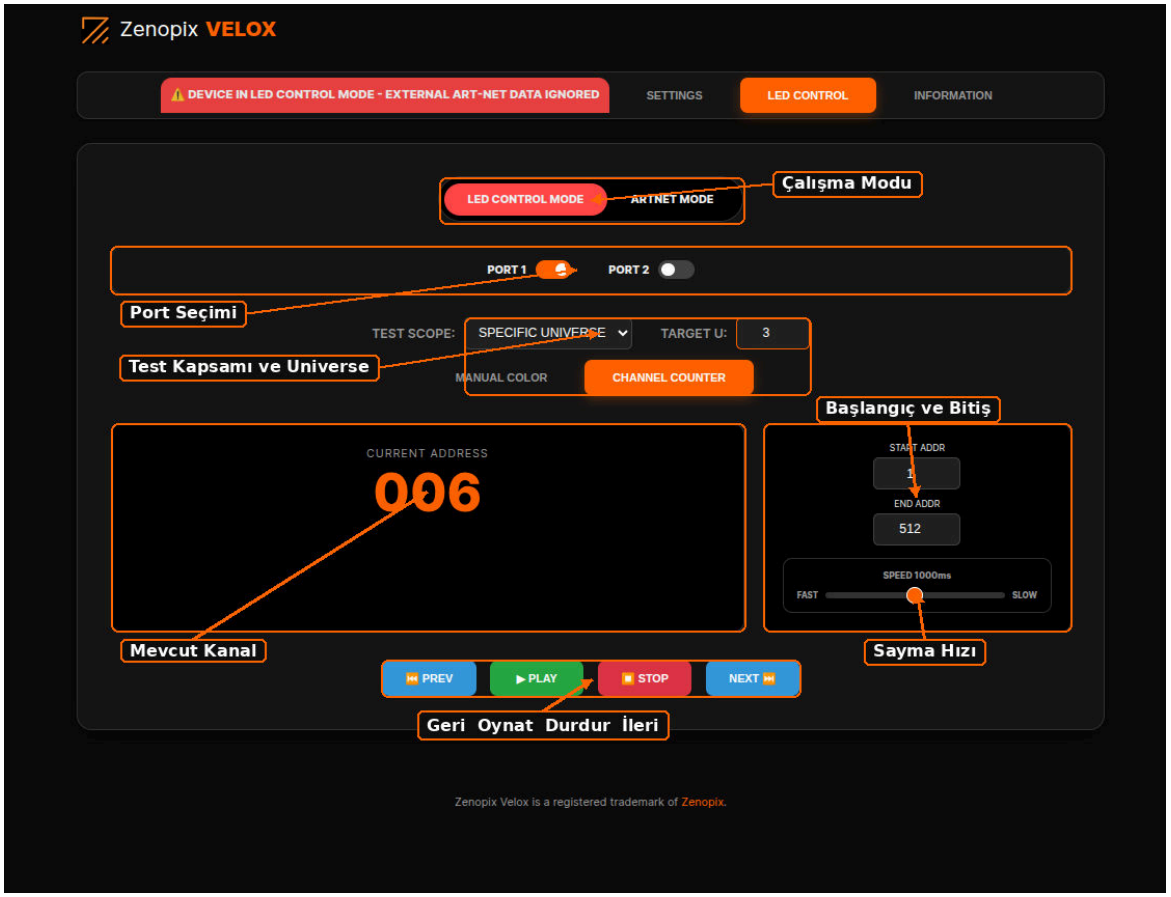


Figure: Annotated channel counter and navigation controls

System Information and Management

• System Information: Shows the serial number, model name, MAC address and firmware version.

• FACTORY RESET: Restores network, LED type, data loss, Universe and test settings to factory values.

• SYSTEM REBOOT: Restarts the device via software without deleting user settings.

• System Updates: Checks the update server and starts the installation when a suitable package is found.

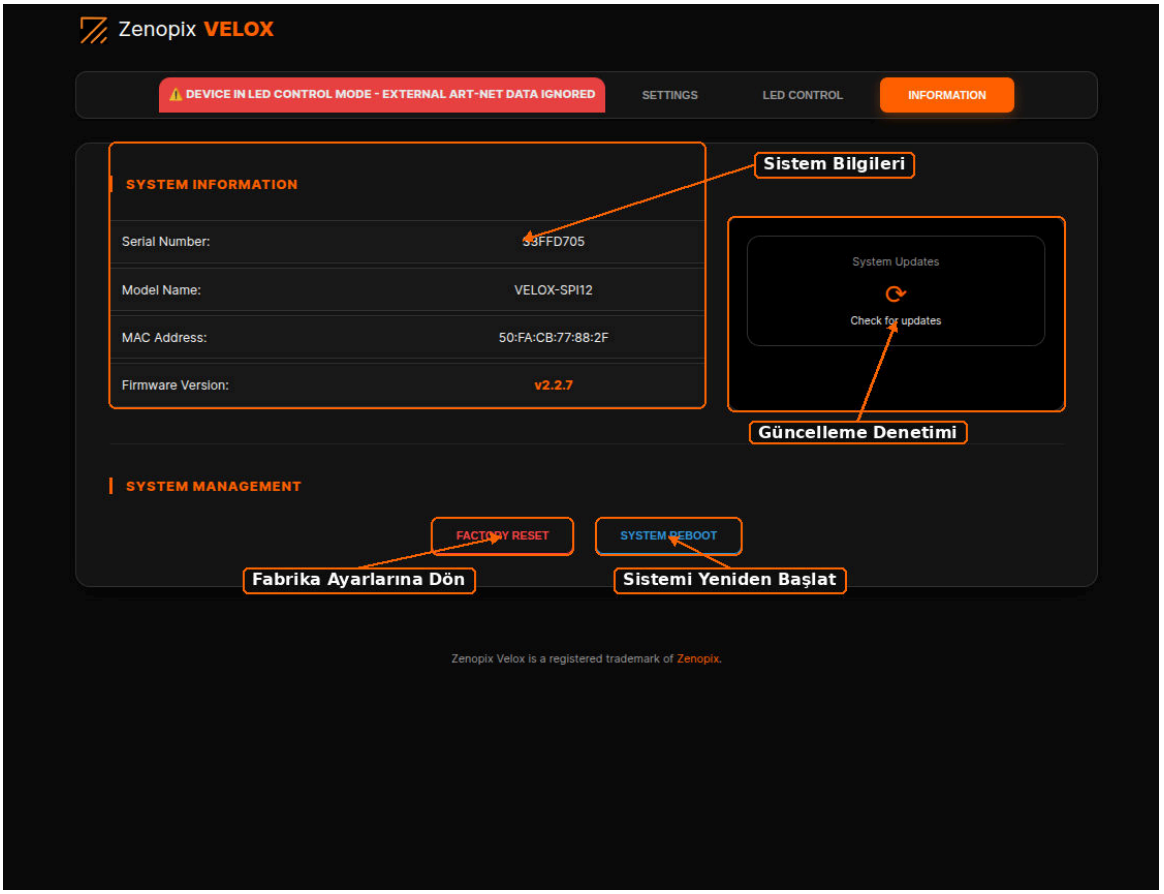


Figure: Annotated system information and management functions

Updating the Firmware over the Internet

During the update, Ethernet, gateway, DNS and internet access must work. Do not interrupt power or the network until download and finalization are complete.

1. On the INFORMATION page, start the update check in System Updates.

2. If a new version is found, verify the version number and press the START UPDATE button.

3. Keep the update page open, with network and power on, until Downloading reaches 100%.

4. After the transfer, wait for the device to finalize the update and restart.

5. After reconnecting, check the installed version in Firmware Version.

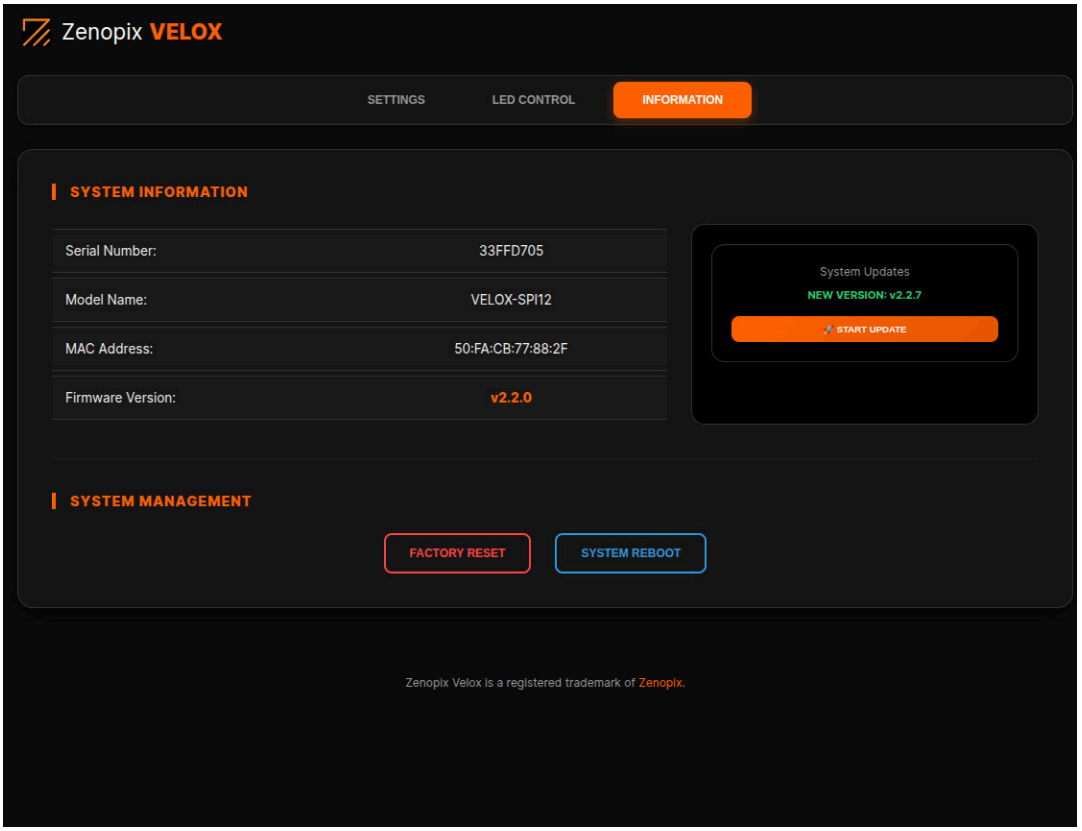


Figure: New firmware version and START UPDATE button

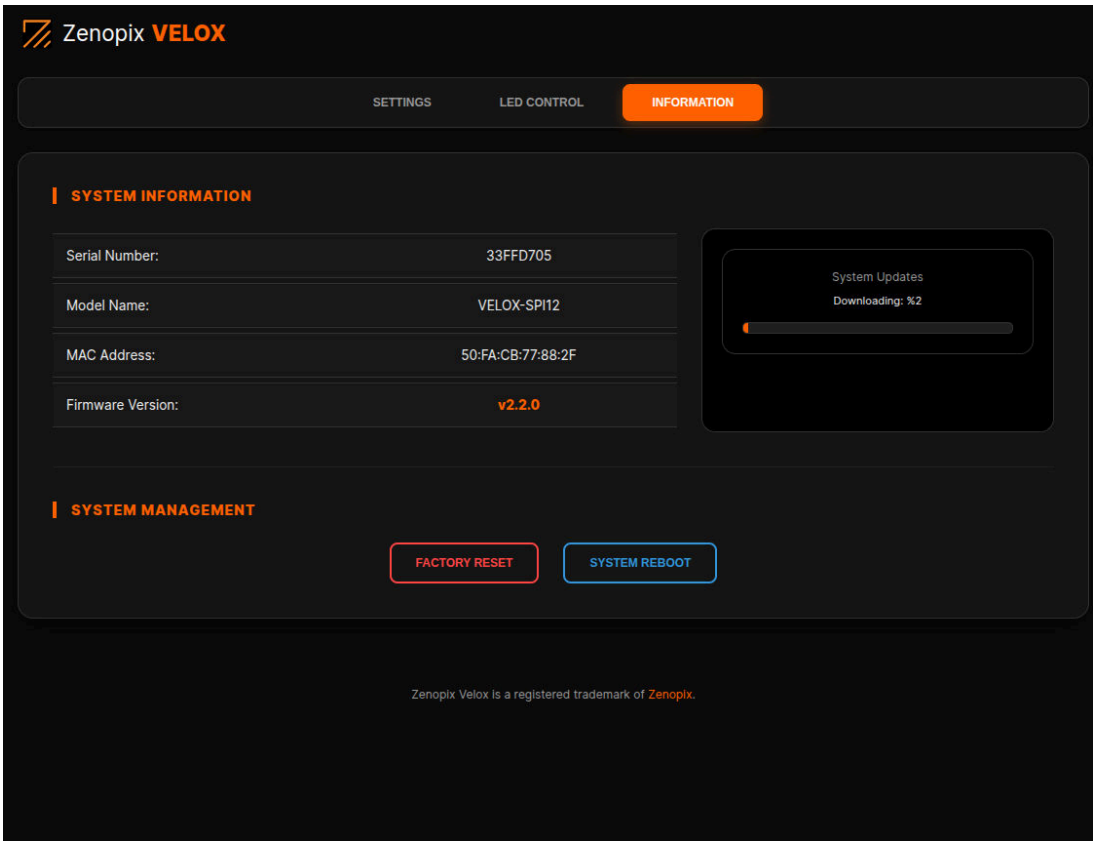


Figure: Firmware download percentage and progress bar

Usage and Update Problems

• Web interface does not open: Check that the computer is on the same subnet, and check the device IP address and the Ethernet connection.

• Art-Net data is not transferred to the output: Verify the ARTNET MODE selection, the number of active Universes, the Global Universe Address mapping and the connected LED type.

• Only part of the output works: Check the Manual Length selection and channel length for the relevant Universe.

• Art-Net not working after a test: LED CONTROL MODE may still be active; return to ARTNET MODE.

• Channel counter does not advance: Check the PLAY status, the Start Addr and End Addr range, the Speed value, the Test Scope selection and the enabled ports.

• Wrong LED colors or order: Verify that the LED Type and the 1-CH to 5-CH channel layout match the connected LED product.

• If the version check fails or the device cannot connect to the server, check the gateway, DNS, internet access and firewall, then try again.

• Update Error: Verify the network connection without turning off the device and restart the update.

If the device does not start after an update or the version information does not change, follow the technical service procedure before power cycling again.

Controlling Velox with Zenopix NEO

Zenopix NEO is a desktop application for broadcasting Art-Net to your devices. It is tailored to all online and offline Zenopix devices, especially Velox.

To create a Velox project in NEO, select Patch->New Patch from the main screen menu and choose the VELOX device as the project parameter.

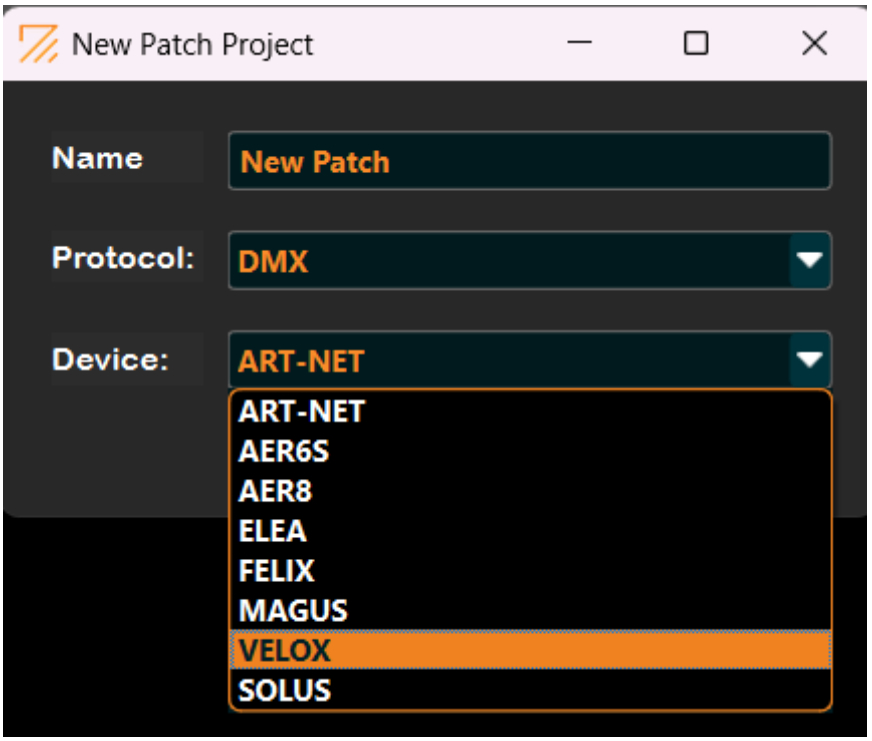


Figure: Creating a patch and selecting the device in Zenopix NEO.

Then set the playback parameters for the selected VELOX device on the Patch screen. The basic information you need here is:

- SPI channel range (Min-Max)
- Group settings, if any

On the Patch screen, click “Add Zenoverse” or the appropriate option for adding playback or a group. Select the target playback group to finish configuring your device.

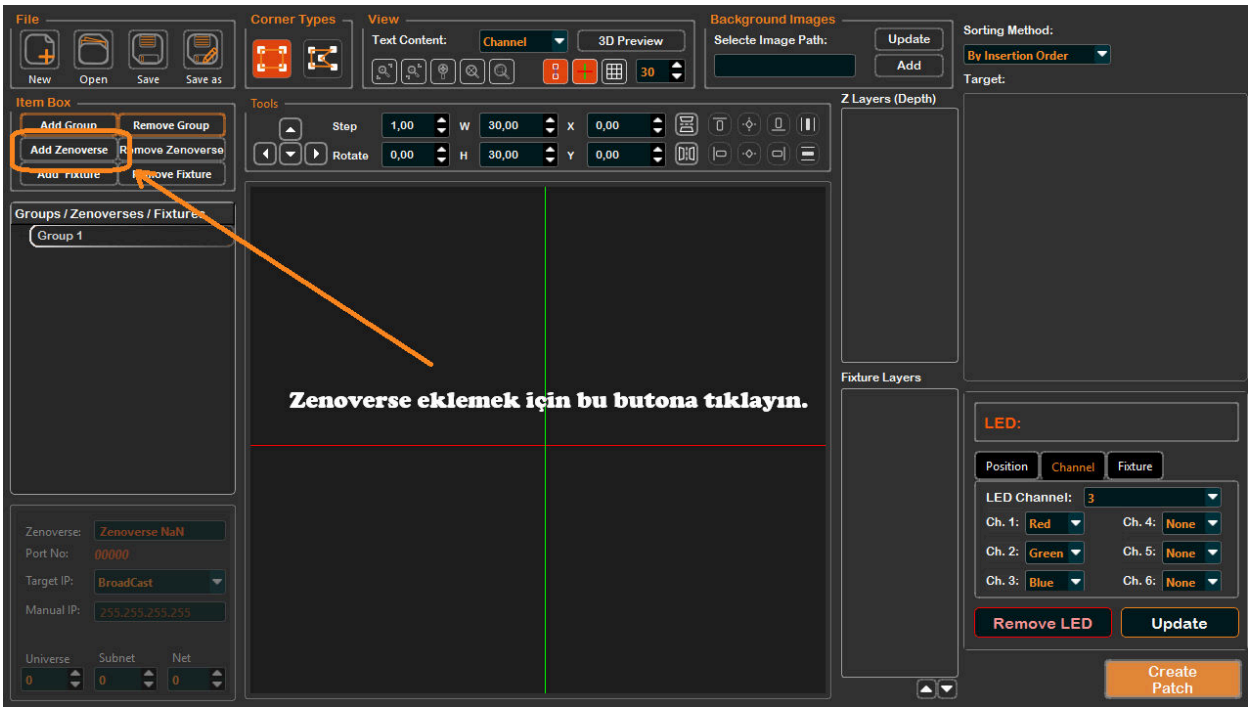


Figure: Creating a patch in Zenopix NEO

“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.

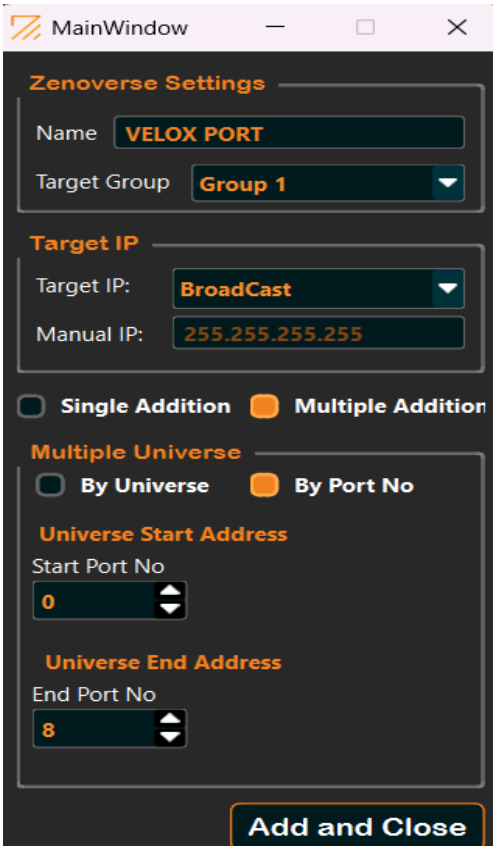


Figure: Defining the device IP address and adding universes (ports) in Zenopix NEO

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

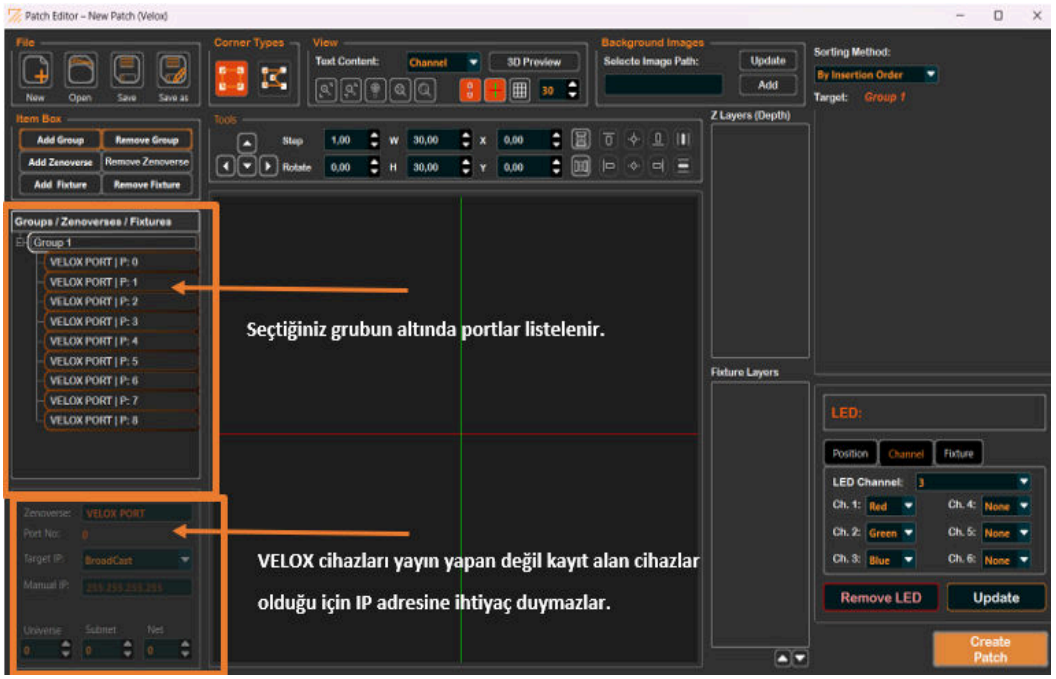


Figure: Adding universes (ports) in Zenopix NEO

Warnings

1. The products must be installed by qualified professionals.

2. Zenopix products are not waterproof (except for special models). Protect the products from direct sunlight and rain. For outdoor installations, mount each product in a waterproof enclosure. Good heat dissipation will extend the service life of the products. Please ensure good ventilation.

3. Make sure the operating voltage meets the product specifications.

4. The wire gauge used must meet the current requirements of the connected lighting fixtures and ensure a secure cable connection.

5. 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.

6. This manual is subject to change without prior notice. Product functions depend on the version. If you have any questions, please do not hesitate to contact us.

Technical Support

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

- Read the Zenopix Velox 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 LED fixtures. What could be the cause?

-The power supply cannot provide sufficient current.

-Non-standard cabling or exceeding the maximum signal transmission distance (10-15 meters for SPI).

-Errors caused by the animation.

Does the device support RDM/DMX?

-No, the device does not support RDM/DMX. For your RDM/DMX projects, you can check out the Zenopix Magus device.

How should I choose between DMX and SPI LEDs?

-Zenopix Velox supports only SPI. For DMX, you can check out our other products on our website (Elea and Magus).

The choice between DMX and SPI depends on the scale, budget and environmental factors of your project:

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

applications where the cable distance between the controller and the LEDs needs to be long. The failure of one LED/fixture generally does not affect the others. Each end device is independent.

SPI LEDs (WS2812, etc.): Generally more cost-effective and can offer higher pixel density. Due to their data transmission structure, they do not require external addressing. However, since their immunity to cable noise is low, they should be preferred for short-distance connections. If part of an SPI LED chain fails, everything after the failed point stops working (except for special series).

I cannot access the web interface (Web GUI). How can I restore the device to factory settings (Factory Reset)?

-Please refer to the "Resetting to Factory Settings with the Reset Button" section of the manual.

What do the blinking LEDs on the front of the device mean?

-Please refer to the "Status LED Codes" section of the manual.

Can I use multiple Zenopix Velox devices at the same time?

-Yes, you can. Make sure your network bandwidth is adequate in projects using multiple Velox units. You can also synchronize with the Zenopix Solus device.

Can I use the Velox device standalone (offline) without a computer?

- Only for single-color applications. Zenopix Velox is an online device. It requires Art-Net data over Ethernet. In applications without a computer, you can use it together with *Zenopix Solus*. For offline applications, you can also check out the *Zenopix AER* product.

Troubleshooting

- **Web interface does not open:** Check that the computer is on the same subnet, and check the device IP and the Ethernet LEDs.
- **Art-Net data does not reach the SPI outputs:** Verify the ARTNET MODE selection, the Universe mappings and the Universe value of the incoming packet.
- **Art-Net not working after a test:** LED CONTROL MODE may still be active; return to ARTNET MODE.
- **Failsafe activates late:** The firmware detects a loss of Art-Net data 10 seconds after receiving the last Art-Net packet.
- **Channel counter does not advance:** Check the PLAY status, address range, Speed value and selected ports.
- **Version Check Failed:** Check the gateway, DNS and internet access, then try again.
- **Cannot Connect to Server:** Check the firewall and internet connection.
- **Server Not Responding:** Check the network connection and try again later.
- **Update Error:** Verify the connection without turning off the device and restart the update.

If the device does not start after an update or the version information does not change, follow the technical service procedure before power cycling again.

Order Code

PRODUCT CODE	VELOX	2	RM	TB
Capacity				
2 Port Outputs		2		
Enclosure Type				
DIN Rail Mount			RM	
Connection				
Pluggable Terminal Block				TB

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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