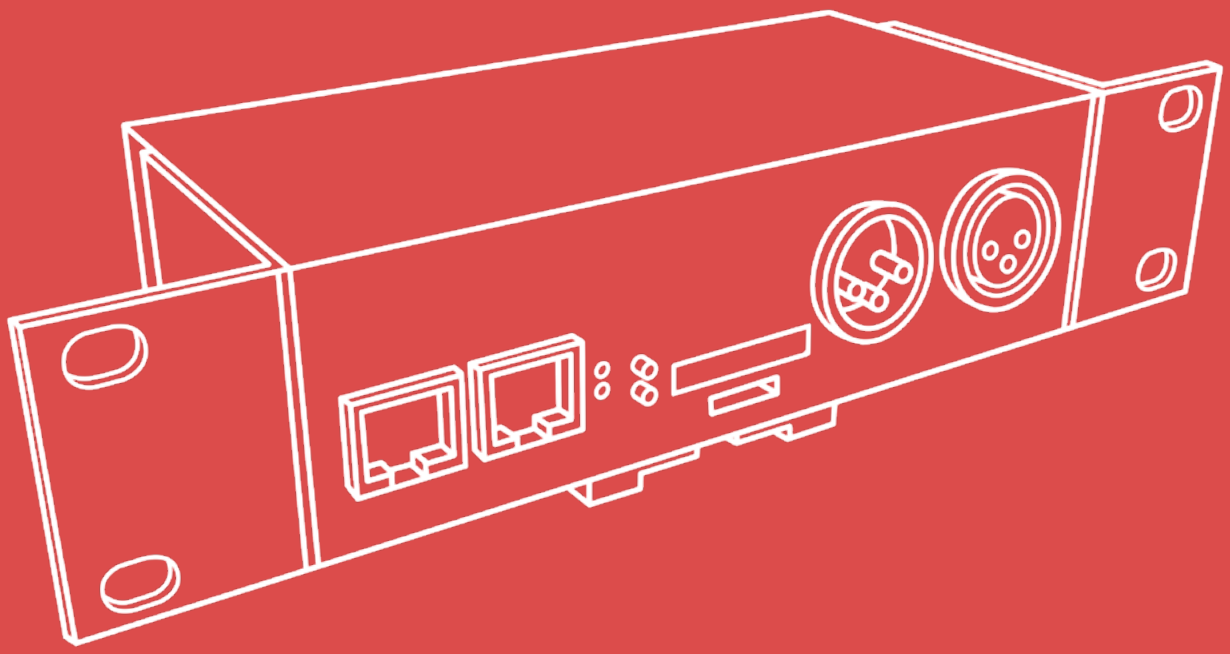

LEC 3
LED Ethernet Controller 3

SPI MATRIX
Art-Net LED Controller

POWERED LEC
Powered LED Ethernet Controller

LED STRIP STUDIO

www.ledstripstudio.com
info@ledstripstudio.com

Table of contents

General information

This manual contains important instructions for the safe operation and installation of the unit. Read and follow the safety instructions and all other instructions.
Keep this manual handy as a reference for operating procedures and safety information.

Specifications in this manual and design are subject to possible modifications without notice due to improvements.

Package content

The LEC3 package consists of:

- **LEC3 controller**
- **L-shape mount brackets set including screws**
- **DIN rail mount including screws**
- **5x suitable 4-pin 5mm pitch cable side pluggable terminal block**
- **micro SD card**
- **micro SD card to SD card adapter**
- **micro SD card USB reader**

Safety instructions

Installation should be performed only by a competent person or professional electrician.

Make sure that the installation complies with the standards and rules that apply in your country.

Do not use the device if it seems to be damaged.

Use the device only as described in this user manual. Any other use or use under other operating conditions is improper and may result in personal injury or property damage. No liability will be assumed for damages resulting from improper use.

Never open the controller and do not attempt repairs yourself.

Do not place the device close to heat sources and always ensure enough ventilation.

Do not place the unit on surfaces that are heat sensitive.

This device has been designed for indoor use only. Do not expose the unit to direct sunlight. Do not allow this product to meet liquids. Electrical shock could result. Also, damage to the product, smoke, and overheating could result from contact with liquids.

Clean the device components that are accessible from the outside regularly. The cleaning frequency depends on the operating environment: damp, smoky or particularly dirty environ ments can cause greater accumulation of dirt on the device components. Clean with a dry soft cloth. Stubborn dirt can be removed with a slightly dampened cloth. Never use solvents or alcohol for cleaning.

Establish all connections when the unit is switched off. Use the shortest possible high-quality cables for all connections. Make sure that cables cannot cause a trip hazard.

Never touch the plug contacts with sharp or metal objects.

Ensure that plastic bags, packaging, etc. are disposed of properly and are not within reach of babies and young children. Choking hazard!
Ensure that children do not detach any small parts (e.g. screws, connectors or the like) from the unit. They could swallow the pieces and choke!
Never let children unattended use electrical devices.

Disposal of your old device

Dispose of this device through an approved waste disposal firm or through your local waste facility. When discarding the device, comply with the rules and regulations that apply in yourcountry. If in doubt, consult your local waste disposal facility.

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Technical details

This document will introduce you to correct hardware connection of LED strips and will provide the most important technical details about LED Strip Studio (LSS) software and LED Ethernet Controller 3 (LEC3), SPI-Matrix and Powered LED Ethernet Controller devices.

In the following table you can see the basic differences between all 3 devices.

	LED Ethernet Controller 3 (LEC 3)	SPI Matrix	Powered LED Ethernet Controller
Art-Net (4096 individual LED pixels over ArtNet)	✓	✓	✓
LED Strip Studio software	✓	✗*	✓
Integrated power source	✗	✗	✓

(*) SPI-Matrix can be upgraded to LEC3 to support LED Strip Studio software.
Contact us for more details at info@ledstripstudio.com.

Generally, SPI-Matrix is the same as LEC3, but without the support of LED Strip Studio software – you can't use it as LED Strip Studio software output device.
Powered LEC Ethernet Controller (Powered LEC) is the same as LEC3, but with integrated power source (320W, 5V, 60A by default, 12 or 24V version on request).

What can you control using the devices?

There are many kinds of digital LED lights you can control using LEC3.
You can control digital LED strips, digital LED pixels or any other special digital lights.
They are also sometimes called dream or individual addressable LED lights.
We use “digital LEDs” or “digital pixels” in the text to address all kind of digital lights (like LED strips, pixels, digital bulbs, ...). Digital LEDs can use different kind of chip and output protocol to control RGB LED color.
LEC3 is now able to use LED strips with SK, TM, WS or APA chips (and many more), but we update the firmware to work with all latest control protocols.

You can use LEC3 in 4 different modes:

- **Ethernet (software)**
- **ArtNet**
- **DMX**
- **Stand-alone (SD-card mode)**

ArtNet and DMX mode can work in two different ways: Pixel or SD-card player.
In Pixel mode the DMX channels are converted directly to pixels (3 channels for every pixel, maximum is 170 pixels per ArtNet Universe). In SD-card player you can only trigger animation LED files stored on SD-card (so you don’t have to use complicated ArtNet or DMX solution with tons of cables).

LSS LED Strips hardware specification

LED strips produced for LED Strip Studio are high quality LED strips developed completely by LED Strip Studio company. Here you can find basic technical details for the strips:

Strip type	**STCL LED Strip 42**
Dimensions	**width: 14.5mm, thickness: 4mm, length: 5020mm**
Number of LEDs	**42 LEDs/meter**
IC	**SK6812 (TM1809 and WS2812B compatible)**
LED pitch	**23.8 mm**
LED type	**5050, ROHS compliant lead-free soldering compatible**
Shortest working segment	**1 LED, 23.8 mm**
Colors	**Full color, 24 bits, 16.7 million colors**
Color channels	**3 channels: Red, Green, Blue**
Grayscale	**8 bit, 256 levels for every channel**
Voltage	**5V**
Maximal current	**1.5A/meter at full white**
LED Size [mm]	**5.0*5.0*1.6**
LED Viewing angle	**120°**
LED Luminous intensity [mcd]	**R: 700-1000, G: 1500-2200, B: 700-1000**
LED Wavelength [nm]	**R: 620-625, G: 522.5-525, B:467.5-470**
Color temperature	**Variable, set by RGB channels**
Expected lifetime	**30000+ hours**
Reel weight (5m LED strip)	**230 g**
Storage temperature	**-40° ~ +80°**
Operating temperature range	**-20° ~ +50°**
Waterproof	**Yes, IP65, protected by silicon tube**
Warranty	**1 year**

LED Strip Studio Software

LED Strip Studio software is the “main brain” of LED Strip Studio system.
It can be used to play video, picture or even live stream on video LED strips
(or LED pixels). This is recommended PC configuration for LED Strip Studio system.
Of course, if the configuration is better, the software will work smoother.

Operating system	**Windows 7, 8, 10**
Processor	**Dual Core (Intel Core2Duo and better)**
Graphic card	**Dedicated - nVidia or ATI/AMD (but new Intel HD cards are also fine)**
RAM	**4 GB**
Hard disk	**200 MB**
Required software	**DirectX 9.0c, Apple QuickTime**
Grabber card for live streamra	**Yes, HDMI – BlackMagic Intensity PRO**
MIDI control	**supported**
OSC control	**supported**
Touch screen	**supported**

LEC 3 - LED Ethernet Controller 3

LEC 3 device

LED Ethernet Controller 3 (LEC 3) is main controller for digital LEDs (pixels, strips, bulbs, ...). Using integrated DMX output, you can also use it to control analog lights (like strips, pixels, PARs, ...). This provides you with convenient way to control all kind of LED lights using one controller.

It integrates Ethernet, DMX and ArtNet controller and stand-alone player for digital lights. It can control up to 4096 LEDs (4 outputs, each 1024 LEDs), but also it can send signal to additional LSS Distributors. Additional LSS Distributors can be used to extend total number of LEDs controlled by one LSS Ethernet to 8096 (distributors support up to 4000 LEDs).

Power	**5V, 0.5A**
Maximal Number of LED pixels to control	**4096 (8096 with additional Distributor)**
Connection	**Ethernet IPv4, DMX In / Out**
IP address range	**Any (192.168.1.1-192.168.1.255 recommended)**
LED Strip Outputs	**4, each for up to 1024 RGB/768 RGBW LEDs**
SD-card	**Up to 32GB, standard FAT32**
Supported IC	**TM, WS, APA (and more)**
Firmware	**Upgradable (we're adding support for new kind of LED IC chips)**

LEC 3 - Front Connectors

LEC 3 front view

Ethernet	To control Ethernet board using LSS software you have to connect your PC with Ethernet board using Ethernet cable.
Status	Three LEDs which show device status: Green – power is on Yellow – DMX or ArtNet is present (fast blink for DMX, slow blink for ArtNet) Red – if on, LSS software is connected to the device over Ethernet
Buttons	Allows you to select file to play in auto-play mode and also to run test patterns (in case the SD card is not inserted). The reset button sets the device to factory default settings
IP/DMX Add.	DIP switch allows you to set IP and DMX address. In auto-play mode can be used to set animation to play.
SD-card	FAT32 micro SD-card for storing LED videos/animations. You can trigger them using DMX, ArtNet or use them in auto play mode.
DMX In/Out IC	You can use DMX In/Out to control LEC3 or LSS software. DMX out can work in through or output mode (it's a bit more advanced comparing to standard DMX).
DMX LED	Indicates, whether the DMX is in though mode (typically in DMX control mode).

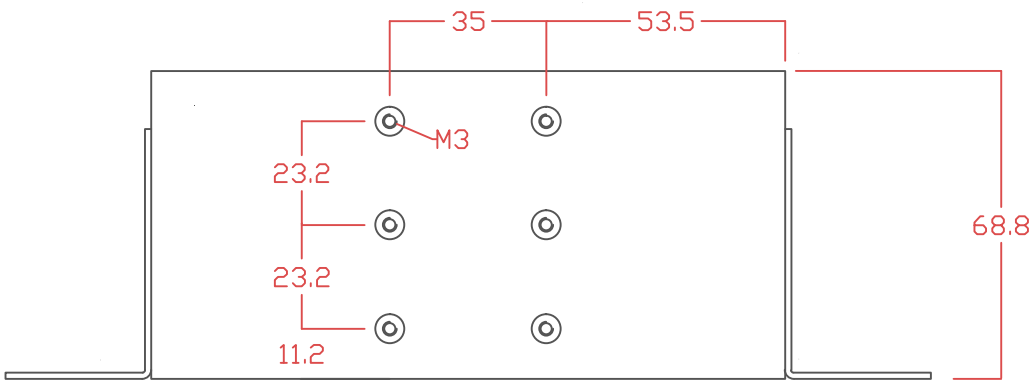
LEC 3 - Rear Connectors

LEC 3 rear view

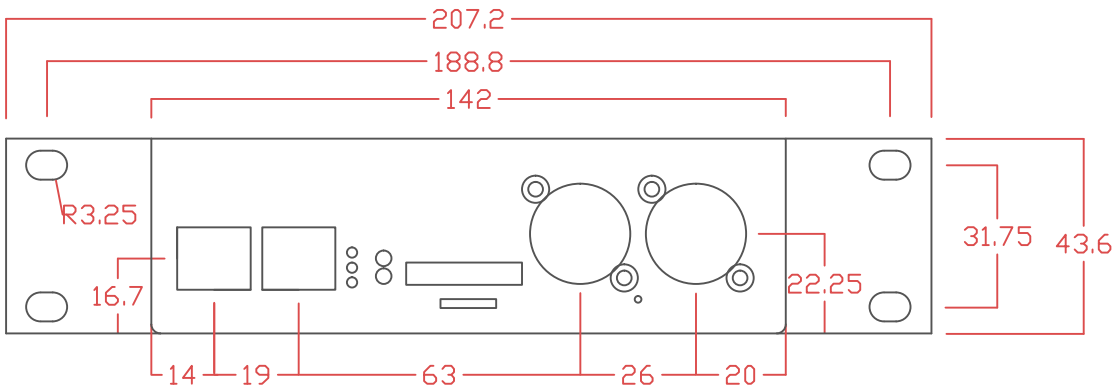
Power in 5-24V DC	**Power connector for power source**
Output 1 - 4	**Powered SPI output for LED strips.**
Output LED 1 - 4	**Output status indicator – flashes when SPI signal is being sent out.**

LEC 3 already contains one LSS Distributor with address 0.
That's why you can directly connect LED strips to LEC 3.

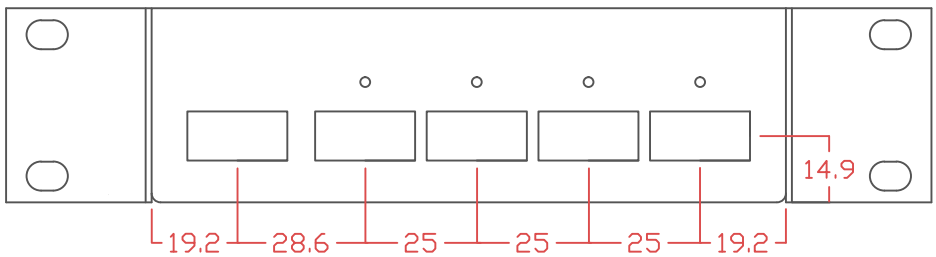
LEC 3 Dimensions



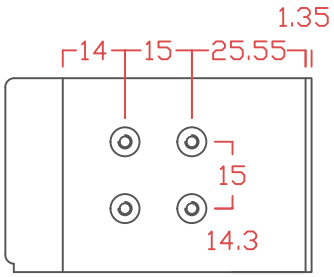
Bottom View



Front View



Back View



Side View

SPI Matrix

SPI Matrix device

SPI-Matrix is pure ArtNet output device. It can't be used by LED Strip Studio software directly (but you can export scenes to SD card LN2 and LNT files and use them). You can use it using following software/hardware controllers:

- **Madrix**
- **Chamsys**
- **MA-Grand**
- **Any other standard ArtNet controller**

SPI-Matrix hardware is the same as LEC3 device, only the license key for LED Strip Studio software is not integrated. It can be used as SD card player though.

Powered LED Ethernet Controller

Powered LEC device

Powered LED Ethernet Controller is basically LEC3 device with integrated power source. PSU parameters are 320W, 5V, 60A (other voltage and power source type on request). It's ideal solution for rental businesses, which want to use digital led lights (strips, bars, pixels, ...).

LEC 3 Ethernet board DMX control

It is possible to use LEC3 also without the computer. You can play animations from SD-card and switch between them using DMX. Here are DMX control channels:

1. Brightness – brightness of drawn image

2. Animation – choose animation from 0 to 255 (up to 256 animations).

3. Animation speed – default speed is 128.

4. Red (change color)

5. Green (change color)

6. Blue (change color)

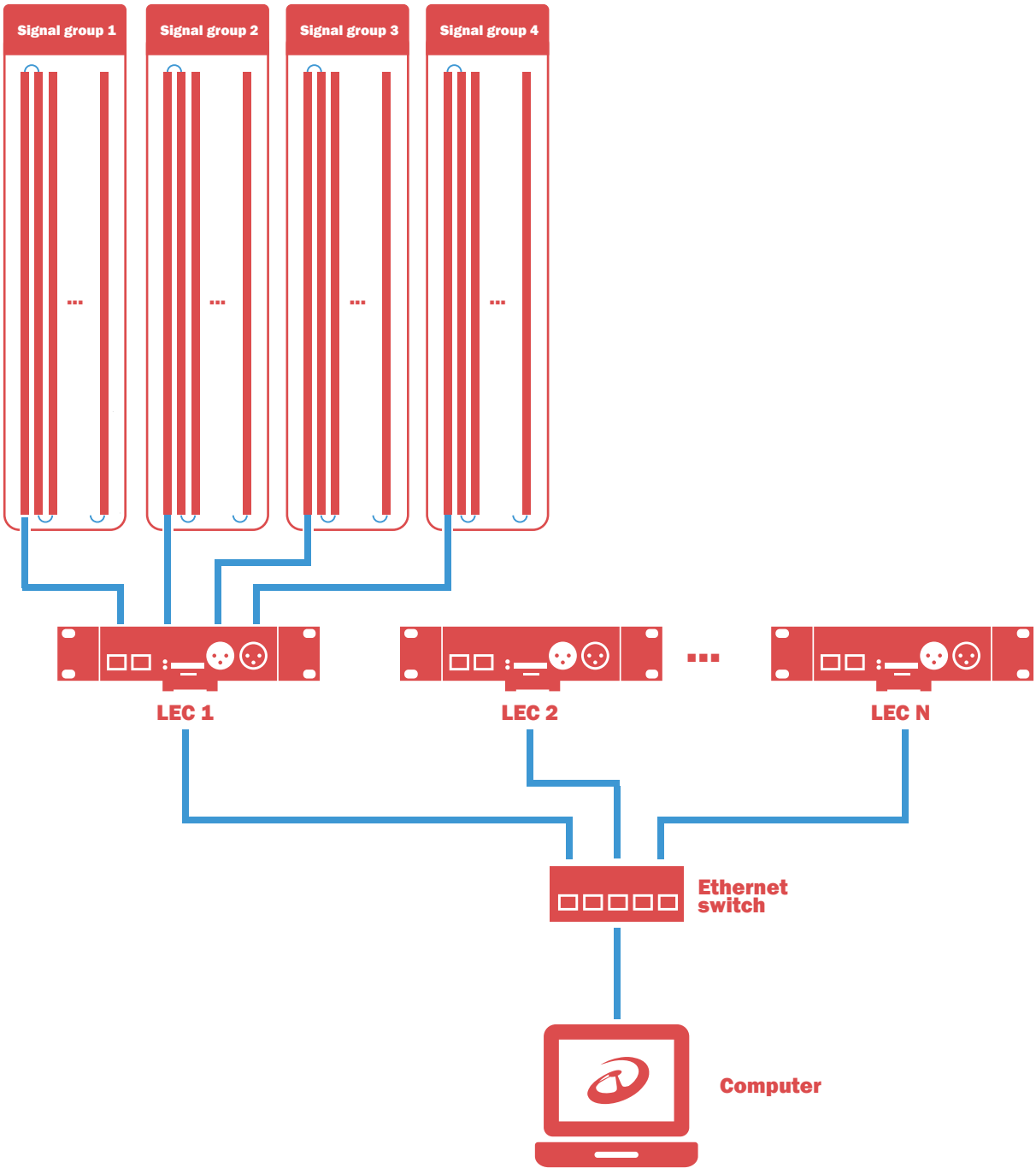
7. White (change color) – used for RGBW strips

Red, Green, Blue and White are used to change color of the image (not to control color channel intensity!). Just make sure, you use RGBW strips in

Software DMX control

It is also possible to control the LSS software using DMX. Please read software manual for more details. But the DMX signal can be connected to DMX input of LEC3 device (and it's being sent to LSS software over Ethernet).

LED Strip Studio - Ethernet and signal connection scheme when using LEC 3



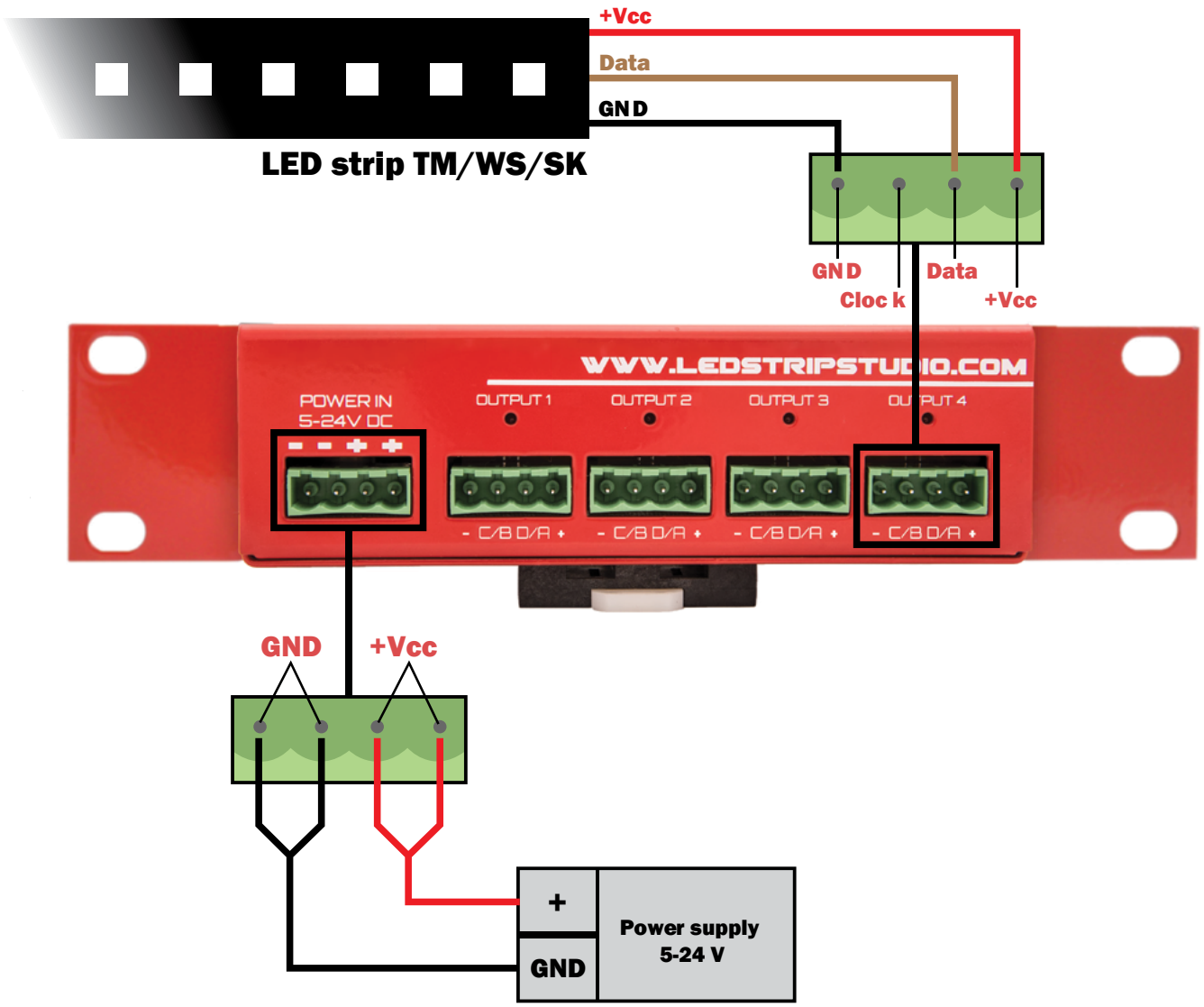
Typical signal connection of LED Strip Studio

You can use several LEC3 devices connected to Ethernet network to handle more than 4096 individual LED pixels (even 50000 and more). Use standard Ethernet switch and Ethernet cables to do that.

Connecting TM, WS, APA or SK family LED strips

Direct connection

Following scheme shows how to connect SPI digital LEDs (TM, WS or SK family digital LEDs), power source and LEC3:



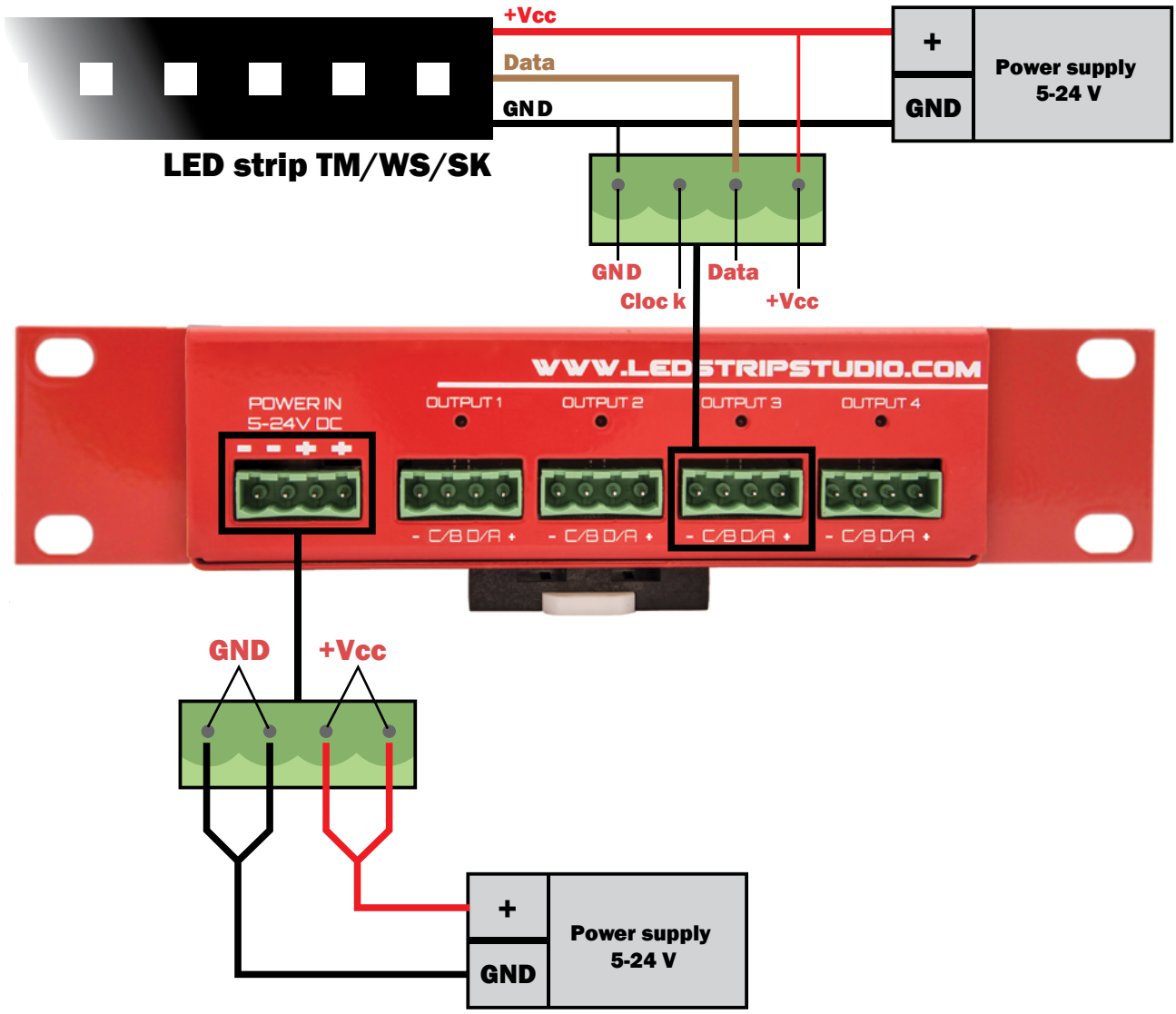
Power source, TM/WS/SK LED strips and LEC3 board connection scheme

You can use 5-24V power supply depending on used digital strips or pixels. The power source can be connected directly to LEC3. The SPI outputs are powered and LEC3 can handle up to 5A output power per output (thus you can use up to 20A power source).

In case you use more power than 5A per output, LEC3 contains polyfuse (a.k.a. poly-switch or resettable fuse), which will prevent destruction and lower the power (you'll see, the brightness of your LEDs will be lower).

Separate power supplies (more than 5A per LEC 3 output)

Following scheme shows how to connect SPI digital LEDs (TM, WS or SK family digital LEDs), power source and LEC3:



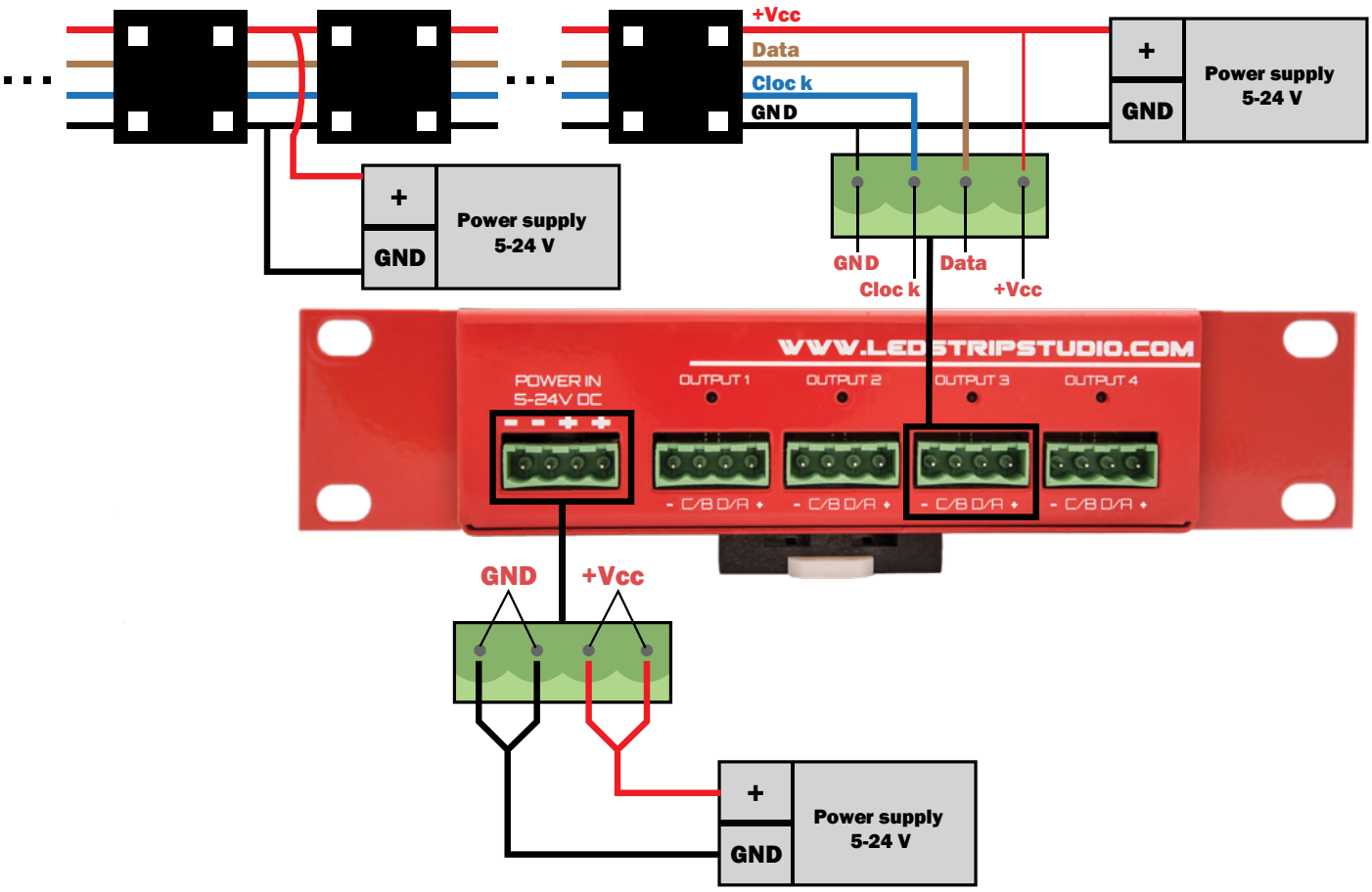
Using separate power supply with TM, WS or SK strips

If you notice, GND is connected to power source and to LEC3. But please connect only +Vcc of the LED strip with LEC3. It might activate the polyfuse and disable signal output.

Notes:

- You need to connect LED strip + and GND to power source.
- If the LED strip is longer than 3m (typically), we recommend wiring both ends to the power source to prevent intensity loss. Intensity loss is caused by voltage drop.
- Clock Ethernet output is connected only when using e.g. WS2801 or APA102 chip-based LED strips.
- When more power supplies are used, you can simply connect them to LED strip (e.g. usually digital LED strips require power boost every 5m to not lose brightness).

Connecting LEC 3 with WS2801, WS2803 LED pixels



Connecting LED Pixels and LEC 3

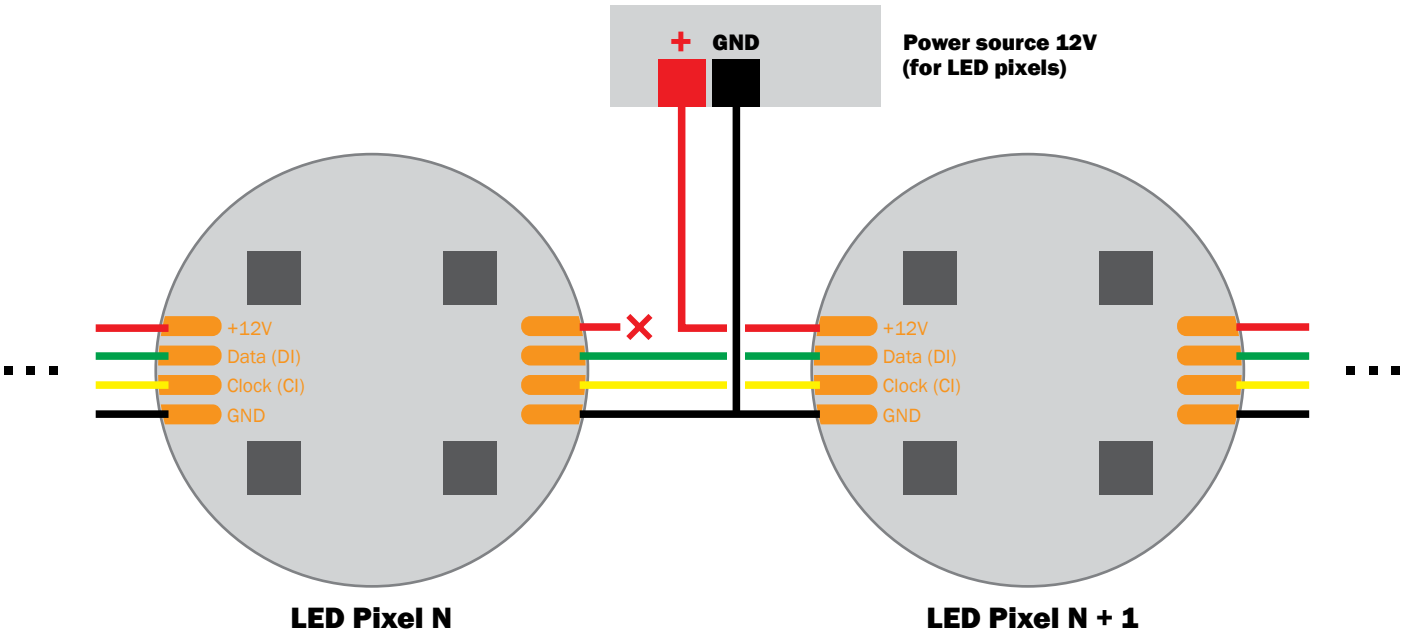
Notes:

- Usually the LED Pixels use 12V power supply!
- LED Pixels usually use WS chips. You must connect also clock signal for the LED pixels! We usually use blue line from LEC3/LSS Distributor and connect it to Clock on first pixel (usually the producers use yellow color).
- The GND line from LEC3/Distributor must be connected to GND line from power source.

Power boost for LED pixels

One output of LEC3 can control up to 1024 pixels (1000 for LSS Distributor). But usually you can't connect 1024 pixels from one side (intensity is lost). You must attach power from additional power source after few pixels. Don't connect the +12V to next segment!

The same trick can be used for LED strips as well.



Pixel power boost

Detailed cable connection for LED strips

There are two GND (ground) pins, one Data and one +5V pin on LSS TM1809 LED strips:

Strip connection at the top

Recommended strip connection at the bottom

If you notice, we use a little trick here – it's better to connect power-source cables to 2nd segment. There is a simple reason why – it's more solid and it's harder to tear the cables from the strip. But please don't use this trick with Data – you must connect data cable to 1st segment!

Recommended wire types

Every installation requires signal and power cables.

Signal cables

Cable type	Where to use
FTP Ethernet cable CAT.5E	• PC to LSS Ethernet • LSS Ethernet to LSS Distributor • LSS Distributor to LSS Distributor • sometimes possible also for LSS Distributor to LED strip
LiY 0.14mm2 black + brown twisted	• LSS Distributor to LED strip • LED strip to LED strip Don't use for signal distance longer than 5m! Only for use in non-heavy EMI interfered environment.
LIYCY 2x0.14mm2	• LSS Distributor to LED strip • LED strip to LED strip Use for longer distance approx. up to 15m.

Power cables 110-230V

Cable type	Where to use
230V AC, H05RR-F - 3Cx1,5 / 3Cx2,5	110V - 230V power distribution/power supplies

Power cables 5V DC

Cable type	Where to use
H05V-K 0.5mm2 black + red	5V distribution for short strips (max 5m) for short distance from PS* (max 2m), also good to trace parallel with strip to decrease losses in strip when strip is longer (3m+)
H05V-K 1.0mm2 black + red	5V distribution for strips (max 10m) for short distance from PS (max 2.5m), also good to trace parallel with strip to decrease losses in strip when strip is longer (5m+)
H05V-K 1.5mm2 black + red	5V distribution for strips (max 15m) for short distance from PS (max 3m)
H05V-K 4.0mm2 black + red	5V distribution for strips (max 40m) for short distance from PS (max 4m)
H05V-K 6.0mm2 black + red	5V distribution for strips (max 60m) for longer distance from PS

*PS=power supply

LEC 3 control modes

You can control LEC3 in 4 different ways:

- **Ethernet mode** - using LED Strip Studio software over Ethernet
- **ArtNet mode** – using any ArtNet controller (console or software)
- **DMX mode** – using any kind of DMX controller
- **Stand-alone mode** – you can store several LED animations on your SD card and play them without any ArtNet/DMX controller or computer.
- **Testing** – great to use different test your installation using standard test patterns.

Ethernet mode

The most common usage of the LEC3 is to use it as LED output for LED Strip Studio software. The main benefit is the real-time control – you can drag and drop and play video, generate nice LED effects or even create complete LED show synchronized with music in the timeline feature of LED Strip Studio.

This is highest priority mode – it automatically stops ArtNet, DMX or auto-play mode.

The DMX IN signal is sent back to LED Strip Studio software. You can use it to control LED Strip Studio software over DMX. DMX OUT is used by LED Strip Studio software (typically to control analog LED strips). DMX OUT is not DMX through in this mode!

There is a complete manual available for LED Strip Studio, please check it to find out more information about it.

Art-Net mode

This mode is automatically activated if there is ArtNet signal coming over Ethernet to LEC3 device (yellow LED is flashing) and LED Strip Studio software is *not* connected to LEC3.

There are two ways you can use LEC3 in ArtNet mode:

- **Pixel**
- **SD-Card**

You can switch between these two modes in LEC3 Web Configuration.

Art-Net pixel mode

This is great way to use LEC3 as a direct digital pixel output for your favorite ArtNet software (e.g. Madrix, MadMapper, MA Grand lightning consoles, ...). In Pixel mode you control every pixel directly using 3 DMX channels (Red, Green and Blue).

One ArtNet universe allows you to control up to 170 individual LED pixels (512 / 3 = 170). But in LEC3 Web Configuration you can define up to 7 universes, which will control all 1024 LEDs of one LEC3 SPI output. Each output can use different ArtNet universes, so you'll be able to control all 4096 individual LED pixels over ArtNet.

For every SPI output you can set first universe and it automatically uses following up to 6 universes to control all 1024 LEDs (you can use lower LED count though).

Art-Net SD-card mode

In this mode you can trigger animations stored on SD card (exported from LED Strip Studio software). You can set what Universe and DMX address to use in LEC3 Web Configuration. LED Strip Studio uses following DMX channels:

Brightness	Animation brightness
Animation	You can select animation 1 to 255 using this channel. 0 is empty.
Speed	Speed of animation. 0 is pause, 128 is default speed of video or animation. 255 is 4x faster than default speed.
Red	*
Green	*
Blue	*
White	*

* Last 4 channels set the color of all pixels (while maintaining intensity levels).It's not intensity of each channel!

You can store up to 255 different animations on SD card. They can be complete shows (10 and more minutes long). Using this mode, you can switch between them to do live light LED show.

DMX mode

This mode is automatically activated when there is DMX signal connected to DMX input and there's no LED Strip Studio software or some ArtNet controller connected to the device.

Again, you can use LEC3 in two ways in DMX mode:

- **Pixel**
- **SD-Card**

The meaning of these modes is the same as in ArtNet mode. The only difference is, in pixel mode you can control only up to 170 LEDs. You can configure both modes in LEC3 Web Configuration.

Auto-play mode

Lowest priority mode. It allows you to play animations stored on SD-card (exported from LED Strip Studio software). By default, LEC3 plays animation selected by DIP switch or defined in Web configuration. But you can use buttons to switch between the animations. Auto play mode is also able to play DMX files (*.LDM) stored on SD card along with the digital animation files (*.LNT and *.LN2). This makes LEC3 a complete standalone digital and analog LED controller.

Testing mode

In case you change settings in the web configuration, you can display several test patterns on the SPI outputs. It's practical to e.g. set correct order of the RGB color channels. You can also activate test mode by removing SD card and using device buttons to switch the different test pattern.

DMX out

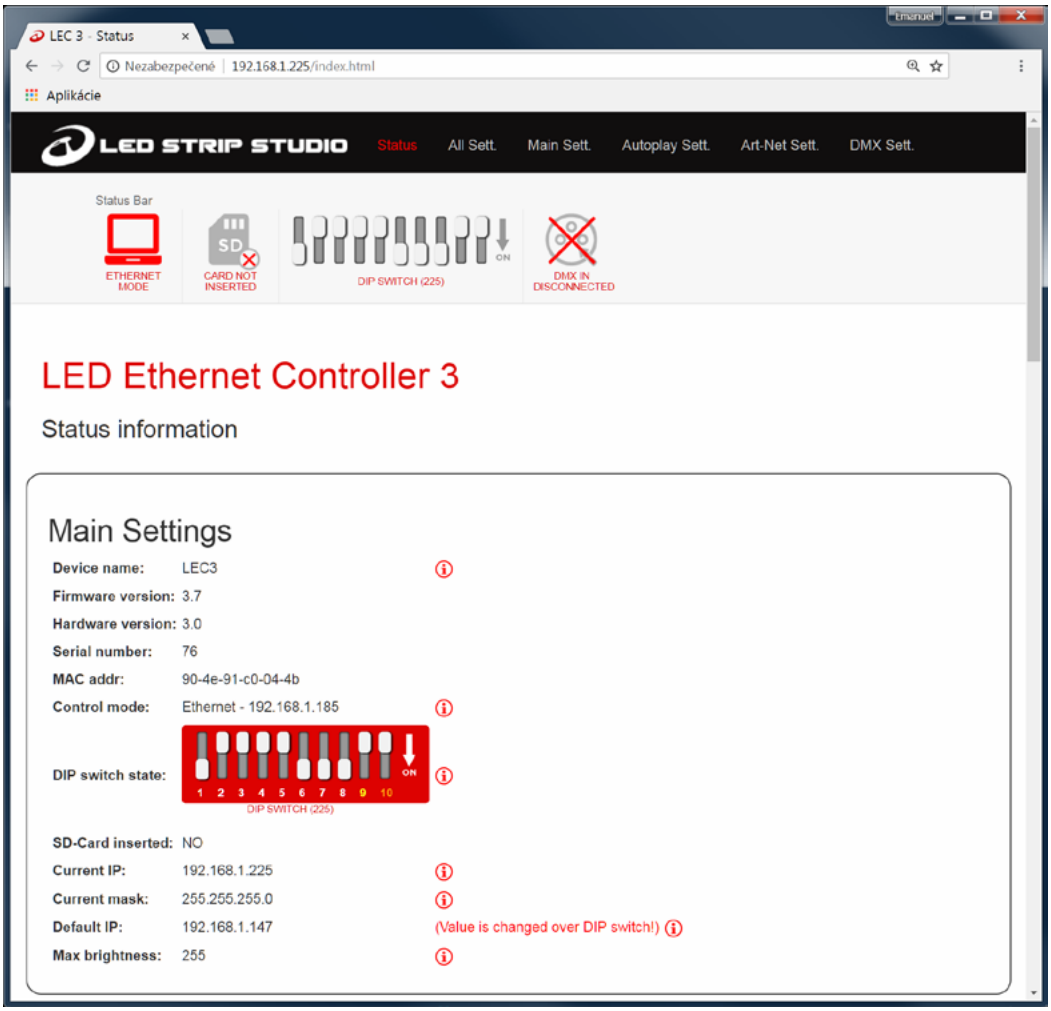
DMX Out can be used in two different modes – Out and Through.

Out	This mode means, the LEC3 device is generating the DMX signal. The signal can be generated from different sources: • In Ethernet mode, LSS software generates DMX out data. • In Art-Net mode you can set one universe to be sent out as standard DMX512 signal. • In case you've exported also DMX file on the SD card (*.LDM and *.LN2), in auto play mode the DMX is generated from this file.
Through	This mode of DMX OUT is active only in case you use LEC3 in DMX mode. Data from DMX in is automatically send to DMX out (like any other kind of DMX light). If the device is in Through mode, the LED diode turns on. Through mode works only if the device is powered.

LEC 3 web configuration

Web configuration allows you to set all important parameters of LEC3 even using your mobile phone (but you can also use any Windows or Mac computer).

To access web configuration, you must type your device IP address into Internet Explorer, Chrome, Safari or any other favorite web browser. E.g. if your device IP address is set to 192.168.1.147, just type “192.168.1.147” into your web browser address:



LEC3 web configuration

Note: Make sure your computer IP address (or your IP router DHCP) is in 192.168.1. address range to be able to access the web configuration.

Main menu

You can select following options in menu:

- **Status** - displays status of the device
- **All Settings** – displays all settings of the device
- **Main/Auto- play/Art-Net/DMX Settings** – using any kind of DMX controller

All settings sections can be accessed only after you login.

Default login for LEC3 device is:

- **User name:** admin
- **Password:** admin

Status bar

You can see following information in the top status bar of web configuration page.

Mode

- Ethernet
- Art-Net RGB pixel mode
- Art-Net SD-card mode
- DMX pixel
- DMX SD-card mode
- Testing

SD-card status

- SD-card is not inserted
- SD-card is ready to be used

DMX In status

- DMX in is not connected
- DMX in is connected and receiving data

DIP Switch

The status bar is “live” – you can see all the changes immediately.

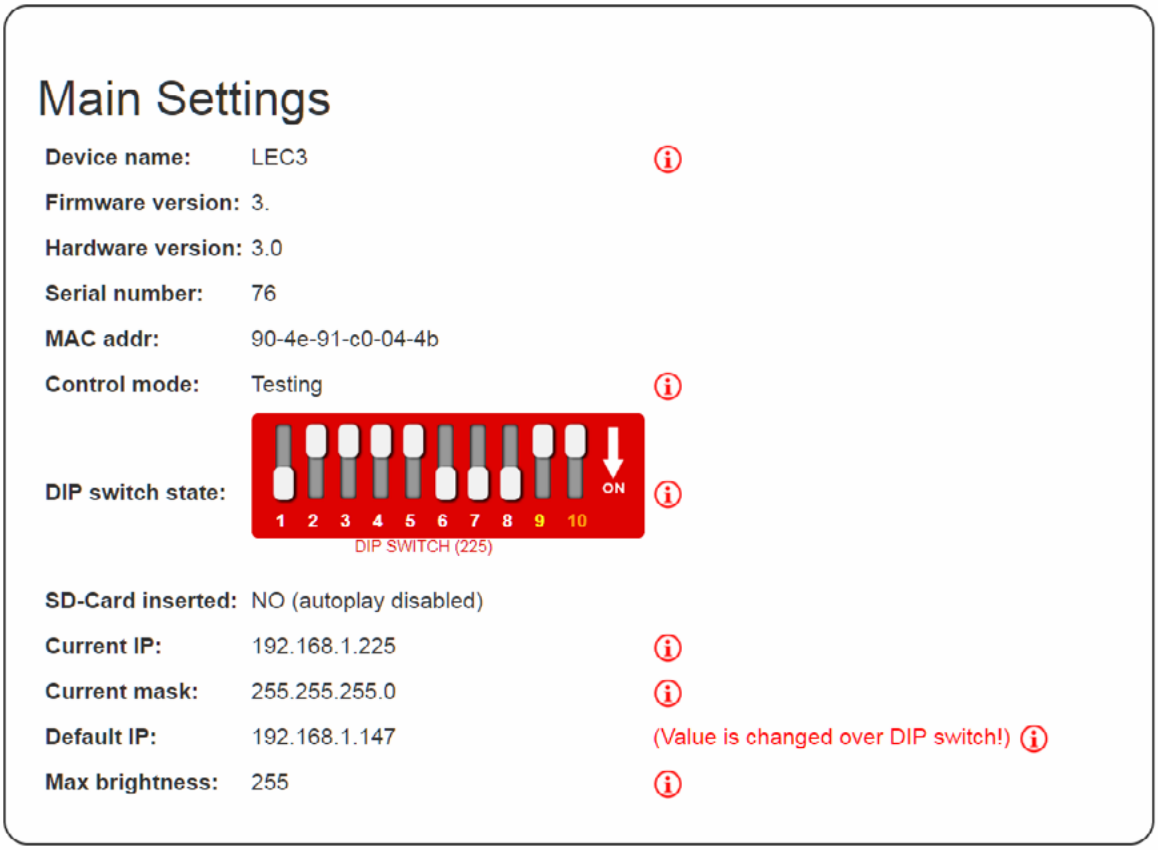
Status

First screen you’ll see after you open LEC3 configuration is the Status screen.

There are several sections of the status.

Main Settings

Contains basic settings of the LEC3 device.

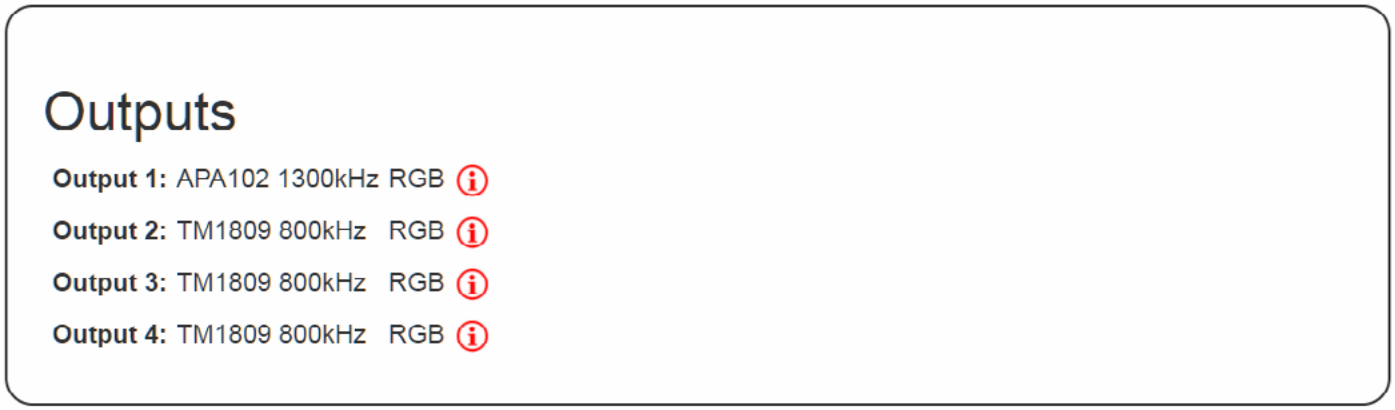


Main settings display basic settings of the device

Device name	Name of the device. You can change this in the settings.
Firmware version	Shows current firmware version. You can update firmware version to obtain latest features and improvements.
MAC address	MAC address of the device.
Control mode	Shows current control mode. See the LEC3 control modes for details.
DIP switch state	Shows the current DIP switch state.
SD-Card inserted	Shows whether SD card is inserted into the device (Yes/No).
Current IP	Displays current IP address of the device. This can be changed using DIP switch or in the configuration.
Current mask	Displays current IP address mask. This can be changed in the configuration.
Default IP	Displays default IP address of the device. Default IP address is used in case the DIP switch is set to 0.
Max brightness	Current maximal brightness of the SPI outputs.

Outputs

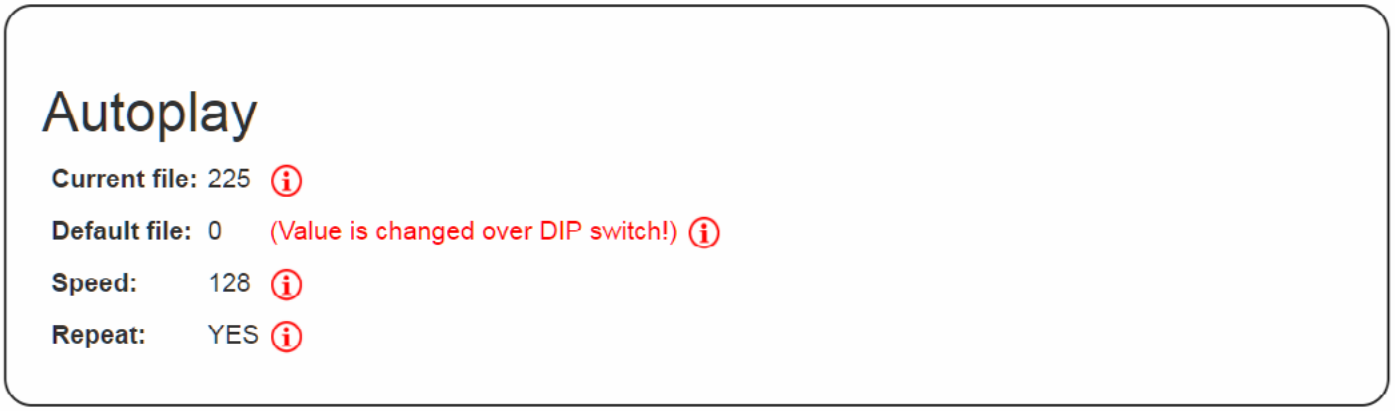
Here you can find information about what type of LED IC is used for every output of the device.



Selected type of used LED IC

Autoplay

In the auto play section, you can find information about auto play settings.



Current file	In case the auto play is active, here you can see, what file is being played. If this is 0, file is not being played.
Default file	Here you can see, what file will be played after the device is started. This can be changed in settings. This setting is used only in case the DIP switch is set to 0!
Speed	Serial number of the device.
Repeat	If this is on, file is repeated. This setting is also used for DMX SD-card and Art-Net SD-card mode.

Playlist

LED Ethernet Controller 3 can now be used as player of several (up to 16 different) files from SD card. In this section you can see actual play list settings. You can set which animation is played and how many times. You can also let last animation of the play list to be played indefinitely.

Playlist

Use Playlist: NO

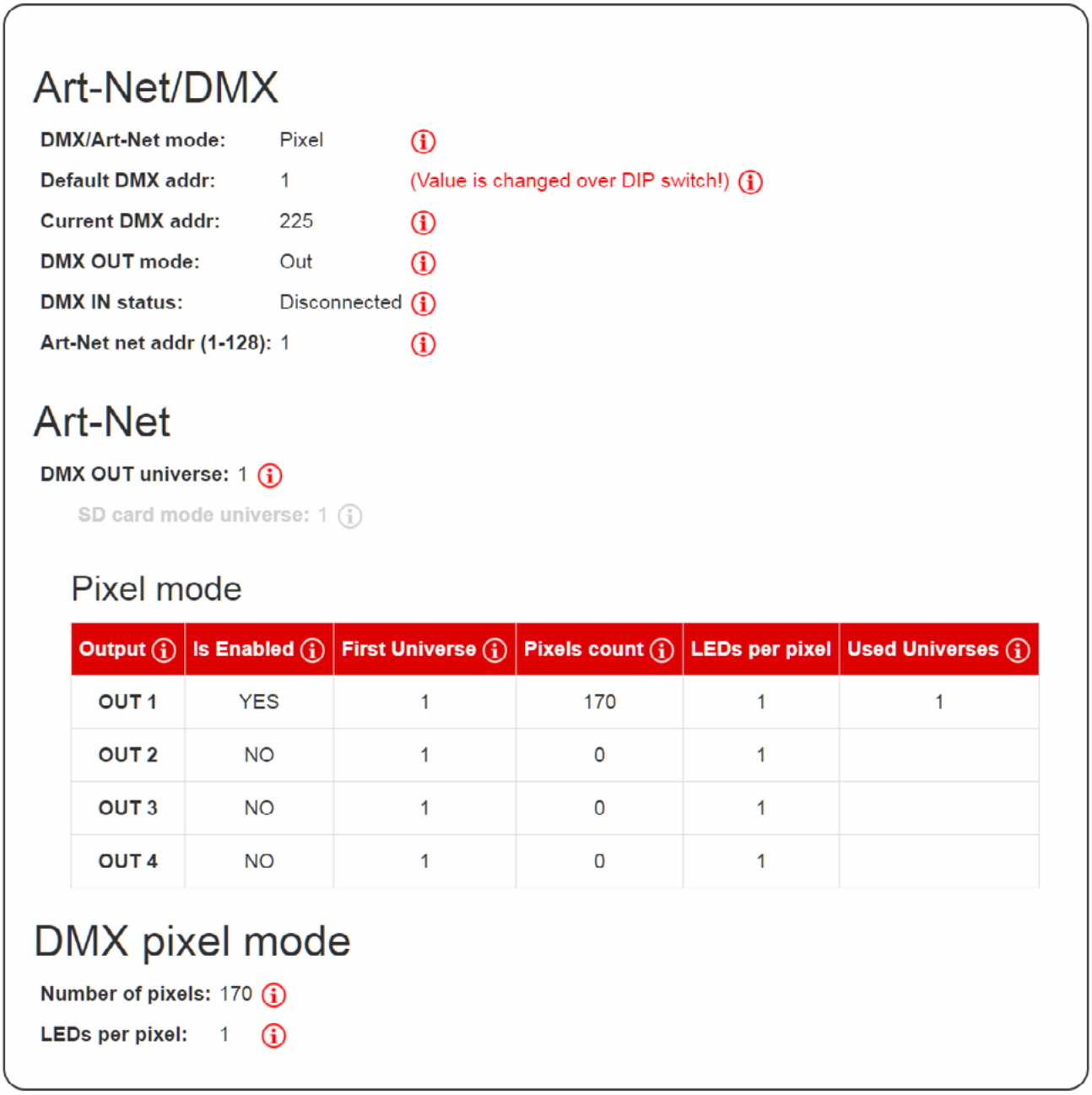
Repeat: YES

Playlist ID	Animation	Repeat count	Loop indefinitely
1	0	0	NO
2	0	0	NO
3	0	0	NO
4	0	0	NO
5	0	0	NO
6	0	0	NO
7	0	0	NO
8	0	0	NO
9	0	0	NO
10	0	0	NO
11	0	0	NO
12	0	0	NO
13	0	0	NO
14	0	0	NO
15	0	0	NO
16	0	0	NO

In our example, the playlist will play animation no. 5 two-times, animation no. 6 seven-times and animation no. 7 indefinitely.

Art-Net/DMX

This section shows settings related to Art-Net and DMX.



Art-Net and DMX settings

DMX/Art-Net mode	You can use LEC3 in Pixel or SD Card mode over Art-Net and DMX. Find more information about it in ArtNet mode.
Default DMX address	Default DMX address in case DIP switch is set to 0.
Current DMX address	Displays current DMX address.
DMX OUT mode	Can be DMX Out and DMX Through. See more details in DMX Out.
DMX IN status	Indicates whether valid DMX512 signal is connected to LEC3 device.
DMX animation step size (1-255)	Displays how many steps of DMX animation channel are used to select animation.

Art-Net

Art-Net net address (1-128)	Sets the ArtNet network.
DMX OUT universe	You can select one universe of incoming Art-Net universes to be sent out as DMX512 signal out of the LEC3 device.
Pixel mode	Display current settings of outputs for Art-Net. • **Out1-Out4** – one of the 4 outputs • **Is Enabled** – indicates, whether output is enabled • **First Universe** – to use all 1024 LEDs you have to combine several universes from incoming Art-Net signal. This shows, which universe is the first one to be used. • **LEDs count** – how many LEDs are being used for selected output. • Used Universes – list of all used universes by the output.

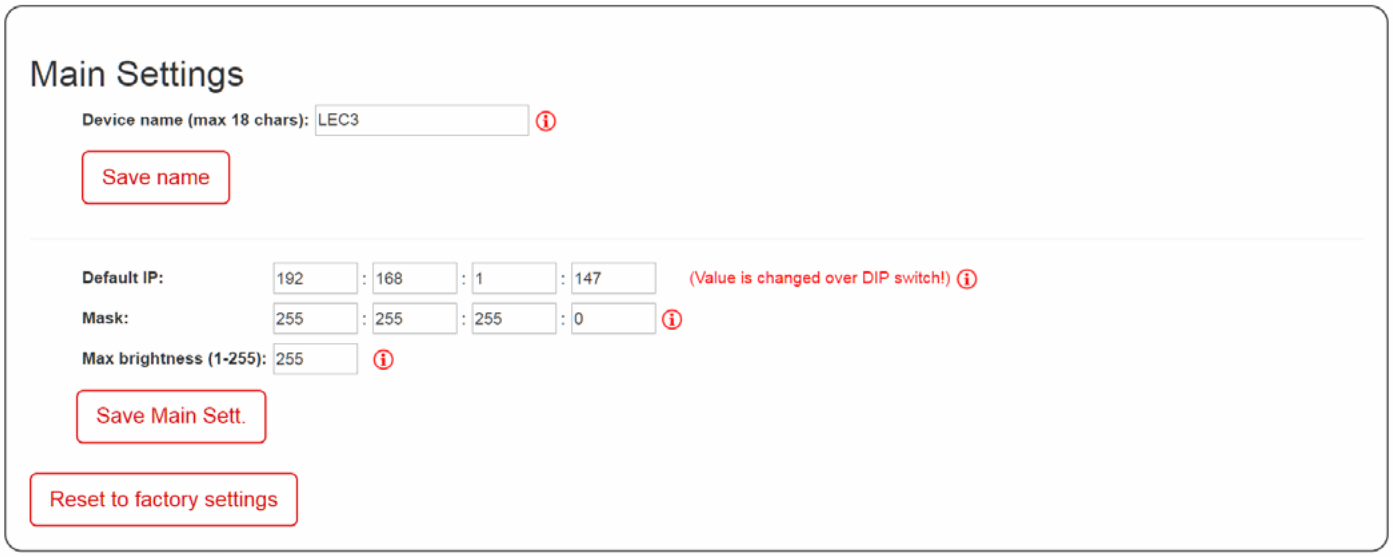
DMX Pixel mode

Number of pixels	Number of used pixels for DMX output (1 to 170)
LEDs per pixel	One incoming RGB pixel (3 DMX channels) can be used several times on SPI output. This number sets, how many LED pixels on SPI output are controlled using 3 incoming RGB channels (e.g. if you set this to 4, four LEDs will have same color / will work as one LED pixel).

All settings

Display all the settings of the LEC3 device. In case you want to display just some of Main, Autoplay, Art-Net or DMX settings, just click some of the link in the main top menu.
This is the list of all the sections with explanation.

Main settings



Contains basic settings of the LEC3 device.

Device name (max 18 characters)	You can set device name for better orientation in case you use multiple LEC3 devices in your installation. You have to press Save name to save the setting after you change it.
Default IP	In case the DIP switch is set to 0, this is the device IP address, which will be used in Local Area Network.
Mask	IP Address mask can be set here.
Max brightness (0-255)	Maximal brightness of all output for all modes. This is practical in case you want to save your LED life by lowering maximal brightness for the users.

Don't for get to press Save Main Settings or Save name after you change some of the setting!

Testing

This allows you to display several test patterns on your LEC3 SPI output.
It's practical to e.g. set the order of the RGB channels or type of the used LED strip (LED IC). Don't forget to press Stop Test after you finish to make sure, the device will stop displaying test pattern!
White dimming is used for 4-th channel in case you use RGBW strips.
All dimming is used for all of the RGBW colors (all 0 to 255).

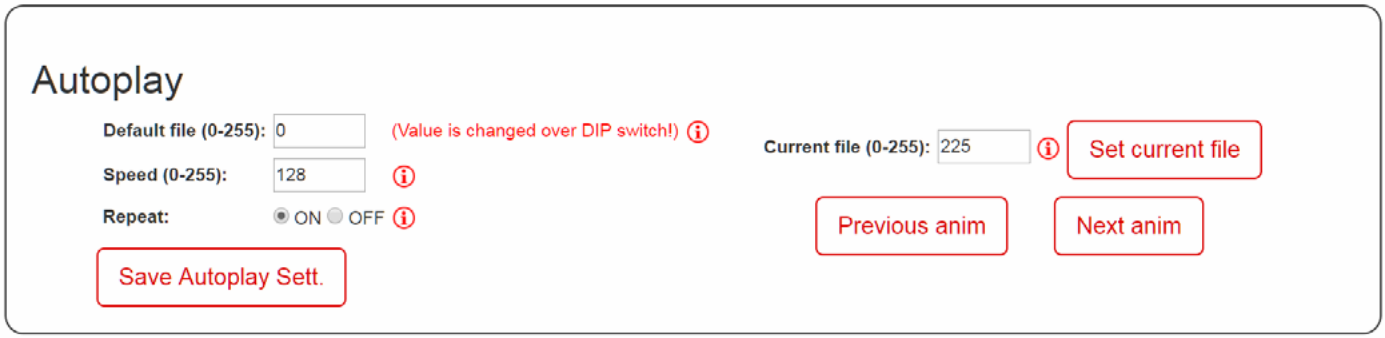
Outputs

Here you can define type and color order of every SPI output.

- **Type** – type of the used LED control IC (chip), e.g. TM1809, WS2811, APA102, ...
- **Color order** – order of the RGB channels. Some strips might use different order of color channels than RGBW. This setting is used only for ArtNet, DMX and Auto play mode. In software the order of channels is set by LSS software.

All these settings are used in Art-Net, DMX and Autoplay modes. In case you control LEC3 from LSS software, you define these settings in the LED Strip Studio workspace.

Autoplay



These settings allow you to define how the device is working in auto play mode.

- **Default file (0-255)** – allows you to select which one of the 1 to 255 files will be used to play automatically after the device is started. In case it's 0, no file is played after start (default setting).

- **Speed (0-255)** – speed of the default file. 0 = stop, 128 = 100% speed, 255 = 400% speed.

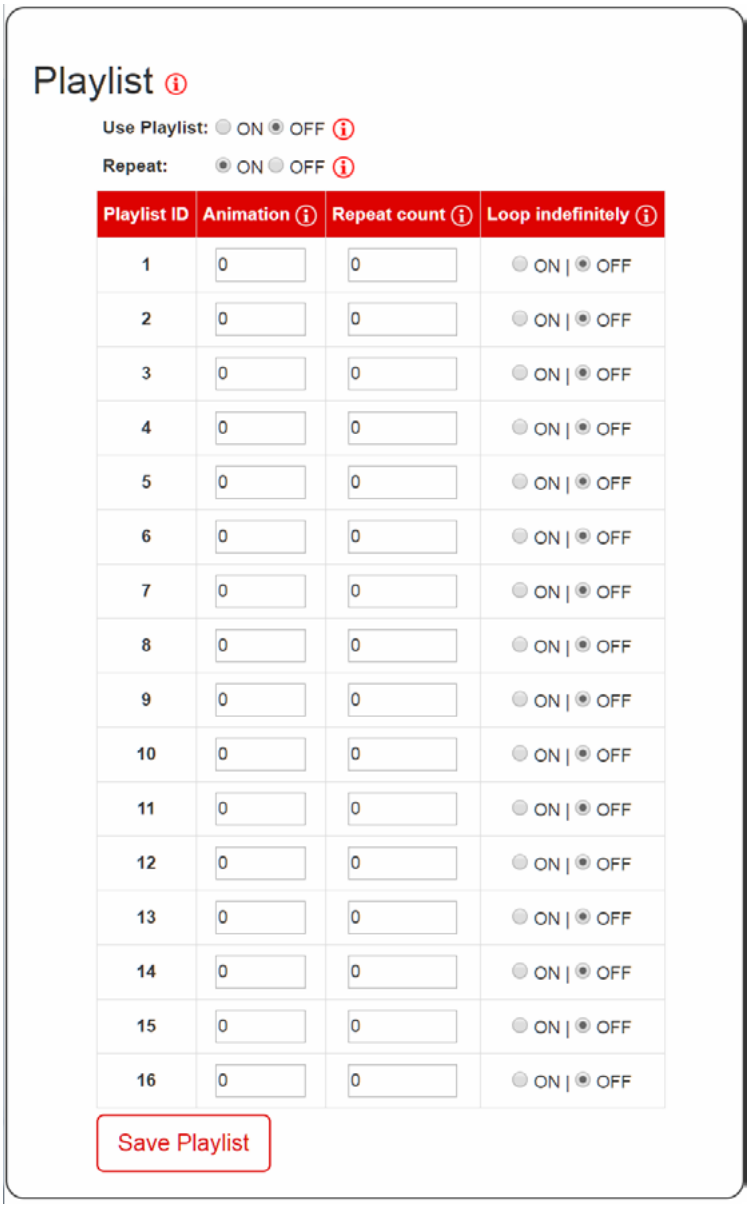
- **Repeat On/Off** – sets repeat of the default file to On or Off. This setting is also used in Art-Net SD-card and DMX SD-card mode.

- **Current file (0-255)** – allows you to preview some of the files without the need of DMX signal or selecting it manually using LEC3 device buttons. Don't forget to press Set current file to display the file. You can also use device buttons to change current file.

In case you change some of the settings, press Save Autoplay Sett. to store the settings.

Playlist

Allows you to define up to 16 different animations to play after each other.
It's kind of a simple show made by different animations stored on SD card (in *.LN2, *.LNT or even *.LDM files).



- **Use Playlist** - turn On or Off the playlist

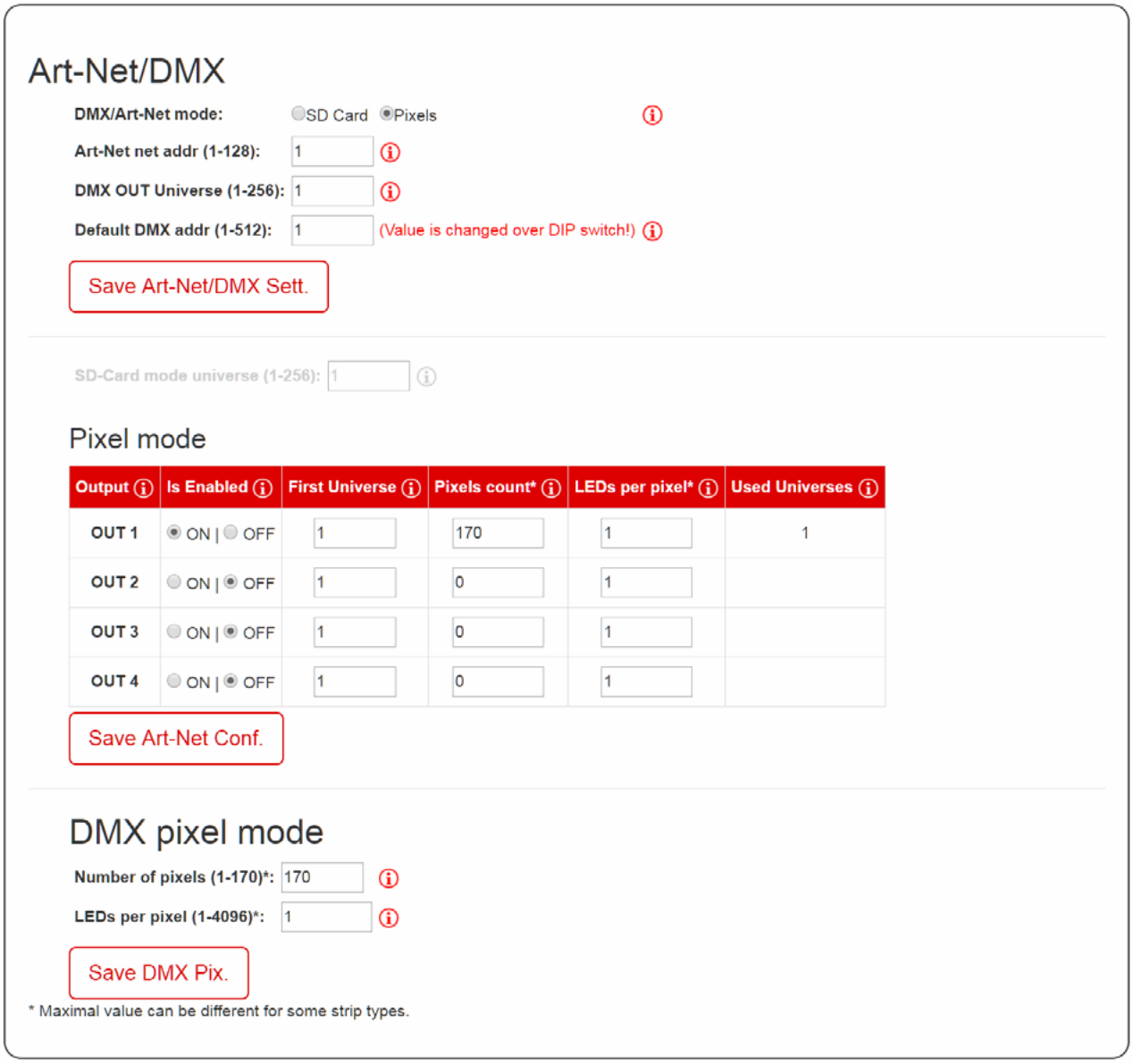
- **Repeat** – if this is On, playlist will repeat indefinitely

- **Animation and Repeat count** – you can define which one of 255 animations on SD card will be played in play list and how many times.

- **Loop indefinitely** – you can set last animation of the playlist to be repeated indefinitely.

The repeat indefinitely is practical e.g. in case, when you want to play some scenes after device turns on and then it plays one animation (e.g. turns on just White channel on all LEDs).

Art-Net/DMX



DMX/Art-Net mode	Allows you to select between SD-card or Pixel mode for Art-Net and DMX
Art-Net net address (1-128)	Set network address of Art-Net (1 to 128)
DMX OUT Universe (1-256)	One universe of the incoming Art-Net universes can be used send out from LEC3 device as standard DMX512 signal. You can define which one it'll be.
Default DMX address (1-512)	In case you use some more simple DMX controllers, it's sometimes hard to set exact value of animation to play. This setting allows you to set how many DMX steps will be used for one animation.E.g. in case you set this value to 4, animation DMX channel set to value 0, 1, 2 and 3 won't play animation, animation DMX channel set to value 4, 5, 6, 7 will play animation 1 and so on. Thus, in case you set this value to 4, you'll be able to play only animations 1 to 63.
SD-Card mode universe (1-256)	In case you use LEC3 in Art-Net SD-card mode, here you can define which universe is used. This is disabled in case you use Art-Net/DMX pixel mode.

Pixel mode	Settings for all the SPI outputs: • **Is Enabled** – you can enable or disable output here • **First Universe** – defines which universe is used as first universe for given output. • **LEDs count** – number of LEDs per given output. • **Used universes** – here you can see what universes are used for given output. Don't forget to press Save Art-Net Conf. to save the settings**.**
DMX pixel mode	This setting is related only to DMX512 input: • **Number of pixels (1-170)** – how many pixels are used of the incoming DMX in signal • **LEDs per pixel (1-4096)** – you can use seveal LED pixels per one RGB pixel from incoming DMX in

Account Settings

You can change your current password. Default name and password is admin/admin. You can reset password by resetting device to default state (by holding Up button at the device power up for 5 seconds).

Notes:

Notes:


LED STRIP STUDIO