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# LeDMX4 PRO Interface



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## USER MANUAL

## TABLE OF CONTENTS

1. Introduction .....	1
Hardware and Firmware versions .....	1
Main Features .....	2
2. Connections.....	3
LeDMX4 PRO .....	3
Status LED Table.....	4
Typical Applications .....	4
3. Default Configuration.....	5
4. Configuration Utility.....	6
Network Tab .....	7
Settings Tab – Firmware 3.3+.....	8
Settings Tab – Firmware 3.1+.....	8
Settings Tab – Firmware 3.0 and earlier .....	10
Port Tab – Pixel Outputs .....	11
Port Tab – DMX512 Port .....	14
Recorder Tab.....	16
DMX Display Function .....	17
Node Report.....	17
Advanced Options .....	17
Art-Net Node Name .....	18
Factory Reset .....	18
5. Ports, Merging, Priority And DMX Input .....	18
Ports and merging.....	18
Supported merging combinations .....	19
sACN / E1.31 Priority.....	19
sACN / E1.31 Priority – DMX Receive.....	19
DMX512 In – Unicast / Broadcast / Multicast.....	19
6. Compatible Software .....	20
7. Technical Specifications .....	21

8.	Where Do I Buy LED Pixels? .....	21
9.	Frequently Asked Questions .....	21
10.	Warranty.....	22
	DMXking.com Hardware Limited Warranty.....	22
11.	Declarations (FCC & CE) .....	22
	Federal Communications Commission (FCC) Declaration of Conformity .....	22
	EEC Declaration.....	23

## 1. INTRODUCTION

Thanks for purchasing a DMXking.com product. Our aim is to bring you high quality products with great features we know you'll appreciate. We ship only what's required which is why there's no CD or printed manual in the box, this is part of our commitment to minimizing environmental impact which also translates into end user savings.

The DMXking.com LeDMX4 PRO is available in 2 versions.

Model	Features
LeDMX4 PRO 5V	Directly drives 5V LED pixel products. Can also provide signal drive for 5-24V LED pixel products where separate power supplies are used.
LeDMX4 PRO 12V	Directly drives 12V – 24V LED pixel products.

Please check carefully before applying power that you have the correct voltage and polarity!

In many LED pixel installations, especially where the majority of pixels may be running simultaneously at full brightness, it is necessary to inject DC power at various points along the pixel strip or string. Although the LeDMX4 PRO can only provide up to 5A per output port terminal block this is not a limitation since currents higher than that will require power injection along the strip anyhow.

## HARDWARE AND FIRMWARE VERSIONS

From time to time minor hardware changes occur in our products usually small feature additions or unseen optimizations. The table below lists LeDMX4 PRO product variants. Check the product label for P/N details.

Part Number	Feature addition
0106-1.0	Initial product release
0106-1.1	Accessory port for external play back triggering added

Firmware updates are released on a semi-regular basis. We recommend updating to the latest available firmware version so all product features are available. Please take note the user manual reflects latest firmware version features unless otherwise noted.

Firmware Version	Comments
v2.2	Initial release
v2.3	Split AP104 from WS281x for timing optimization. Corrected timing issue with ports 1&2.
v2.4	Relaxed Art-Net protocol version check to account for Arkaos byte order error.
v2.6	ArtNet 4 support, IGMP report fix, DMX Port A usable for pixel output source and sync universe, Snapshot Port A useable for pixel output, Full Mapping mode enhancements, Pixel output engine improvements, HTP Merging for pixel outputs, DHCP support added.
v3.0	Record playback added, RDM enhancements, Universe Sync, IGMP report when universe change + unsolicited option, DMX IN Single IP. *Update to v3.1 is highly recommend.
v3.1	Maximum 4 universes mapped to each pixel output 680 RGB, ArtNet 4 all pixel universes reported, NodeReport messages, External trigger port added, RGBW support, Additional pixel types, Auto-universe usage based on pixel configuration, ArtAddress configuration of pixel universes, Zero pixel length issues eliminated, Dynamic IGMP reporting based on current port configurations.

v3.3	Record/playback enhancements, up/down show trigger limited to consecutive range, individual show scripts, tftp delete function, pixel output master level control, APA102C Intensity+XXX 4ch mapping, sACN multicast playback, fixed bug with DMX IN pixel control without network, blackout show255 defined, UCS8903/UCS8904 16bit RGB/RGBW pixel support.
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## MAIN FEATURES

- Designed for integration into your custom LED designs.
- DIN rail mount with DIN clip accessory.
- 4 Independent pixel outputs each with 5A supply capability.
- 1x DMX512 IN/OUT port.
- Directly drives WS2811, WS2812, WS2812B, WS2813, UCS1903, UCS2912, UCS8903, UCS8904, PL9823, TM1934, APA101, SK9822, APA102, APA104, APA106, INK1002, INK1003, SM16703, SK6812, WS2801, LPD6803, LPD8806 and many more compatible LED strips.
- Selectable clock/data rate to suit long cables or fast output.
- Up to 680 RGB pixels or 512 RGBW pixels per output spanning 4 DMX universes (2720 RGB pixels / 16 universes per board). Requires firmware 3.1+
- Up to 340 16bit RGB pixels or 256 16bit RGBW pixels per output. Requires firmware 3.3+
- Automatic RGB, RGBW color order correction or raw mapping options.
- Per pixel intensity control for APA102/SK9822 utilizing the 5bit current pre-regulator. Requires firmware 3.3+
- Master Level control independent of incoming universe streams. Requires firmware 3.3+
- Flexible Full Mapping option for outputs permitting any start address and zig-zag corrections for up to 340 RGB pixels.
- Null pixel support for longer runs to first active pixel.
- Static IP or DHCP network addressing.
- Supported operating systems: Any with Ethernet networking support. Windows, MAC OS, Linux, iOS, Android....
- Art-Net broadcast, Art-Net II,3 & 4 unicast, sACN/E1.31 Multicast and sACN Unicast support.
- HTP Merging of 2 Art-Net or sACN sources in any combination.
- Merge 2 streams of Art-Net/sACN or DMX input -> Pixel universe output.
- DMX512 Input Port -> Pixel universe output.
- sACN Priority takeover for multi-tier controller arrangements
- Mix and match ArtNet with sACN merge/priority sources
- User configuration of Art-Net Node short and long names
- Fully compatible with \*ALL\* software and hardware that supports Art-Net I, II, 3 & 4 and sACN protocols.
- Works with your existing console if Art-Net or sACN external nodes are supported.
- Universe Sync Art-Net, sACN and Madrix Post Sync. Requires firmware v3.0+
- Recording and playback to microSD card (not included). See eDMX PRO Record / Playback manual.
- Standalone show playback without computer or network connection.
- Configuration utility with basic Art-Net output/input test functionality.
- Firmware updates can be performed by end user.

IMPORTANT: In many LED pixel installations, especially where the majority of pixels may be running simultaneously at full brightness, it is necessary to inject DC power at various points along the pixel strip or string. Although the LeDMX4 PRO can only provide up to 5A per output port terminal block this is not a limitation since currents higher than that would require power injection along the strip anyhow. Contact DMXking technical support for additional advice.

LeDMX4 PRO products consider Art-Net 00:0:0 to be Universe 1 (i.e. offset by 1) so there is an easy mapping between sACN/E1.31 and Art-Net.

## 2. CONNECTIONS

### LEDMX4 PRO



5V LeDMX4 PRO

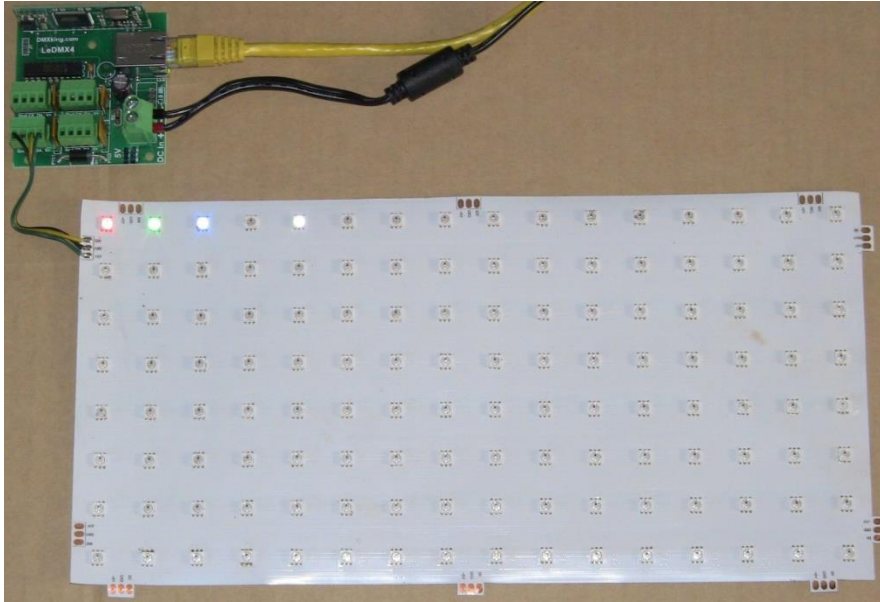
12-24V LeDMX4 PRO

- DC Power Input – Supply polarity marked on board. Note supply voltage is marked. Pay careful attention!
- Ethernet 10/100Mbps RJ45 socket
- 4x 4way 3.5mm pitch pluggable terminal blocks for pixel strip outputs. GND, Clock [CK], Data [DA], V+
- 1x 3way 3.81mm pitch pluggable terminal block for DMX512 port.
- Warning not all pixel strips/products use the same wire color code. Double check the signal names match wire colors.
- Optional DIN rail clips available for insulated board carrier supplied with unit.

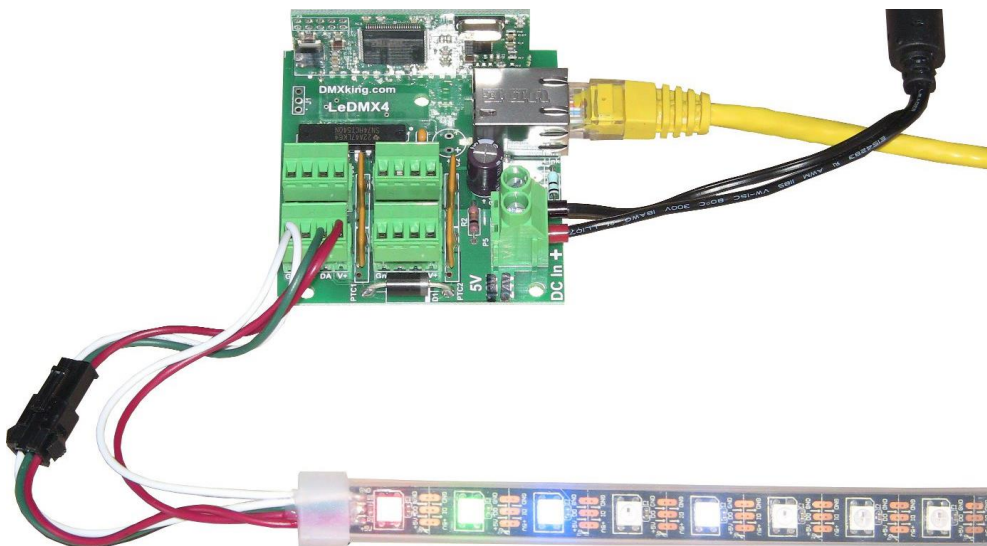
## STATUS LED TABLE

LED	Indication
Protocol – During power up	Flash Yellow during boot up for 2 seconds. Solid Yellow after boot up = Firmware Update mode.
Protocol – Operation	Protocol activity. Flash Yellow = Art-Net/sACN. Slow/fast regular flash = Record Playback functions.
Network	Network activity. Green = Link, Flash = Traffic

## TYPICAL APPLICATIONS



LED Pixel Array



LED Pixel Strip

There are many pixel types and form factors available. Please check carefully when designing for your application.

### 3. DEFAULT CONFIGURATION

LeDMX4 PRO units ship with default static IP address settings. Please reconfigure for your local area network requirements before use.

Default configuration is for WS2811/2812 pixel output with automatic RGB color order correction and 1 DMX universe mapping to 170 RGB pixels per output.

#### **Network Tab**

Parameter	Default Setting
Network Mode	Static IP
IP Address	192.168.0.113
Subnet Mask	255.255.255.0
Default Gateway	192.168.0.254

Pixel Output and Art-Net configuration parameters are configured with the following default values.

#### **Settings Tab – v3.1+ firmware**

Parameter	Default Setting
Update Rate	30Hz - Universe Sync will override.

#### **Settings Tab – v3.0 firmware and earlier**

Parameter	Default Setting
Update Rate	30Hz
Synchronization Mode	None (not used in firmware 3.0+)
Pixel Mapping Mode	RGB 1 Universe
Incoming Universes	1 thru 16 (Art-Net 00:0:0 – 00:0:F)

LeDMX4 PRO products consider Art-Net 00:0:0 to be Universe 1 (i.e. offset by 1) so there is an easy mapping between sACN/E1.31 and Art-Net.

#### **Port Tabs (1-4)**

Parameter	Default Setting
Pixel Type	WS2811
Pixel Count	170



Null Pixels	0
Color Order	GRB
Start Universe	1,2,3,4 (Ports 1,2,3,4 respectively)
Start Channel	1
Pixel Group Size	1
ZigZag	0
Direction	Normal (unticked)

**IMPORTANT:** When Start Channel = 1, Pixel Group Size = 1, ZigZag = 0 and Direction = Normal firmware v3.1+ automatically disables full pixel re-mapping functionality. If any of these 4 parameters is changed from defaults firmware v3.1+ will switch to full mapping mode which is currently limited to 340 RGB pixels.

**Port Tab A (DMX512 port)**

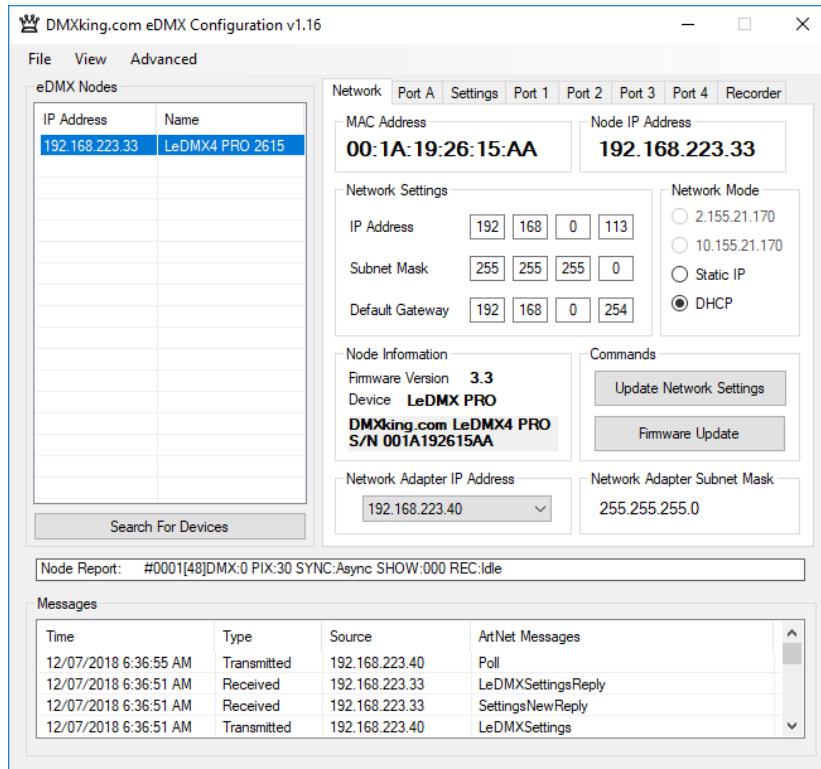
Parameter	Default Setting
Operation Mode	DMX Out
Fixed IP	0.0.0.0 [Only for DMX IN – Unicast to 1 IP address only] v3.0+ only
DMX Universe	1 [Net 00, Subnet 0, Universe 0]. Note sACN Universe 1 = Art-Net 00:0:0
Merge Mode/Timeout all sources	HTP, Timeout <i>unchecked</i>
DMX512 Update Rate	40 [DMX512 frames per second]. Universe Sync will override.
RDM Packet Spacing	1/20s
RDM Discovery Period	0s [RDM Disabled]
Broadcast Threshold	10 [Art-Net II/3/4 unicasting up to 10 nodes]. Set to 0 for Art-Net I broadcast with DMX IN ports.
Recall DMX Snapshot at startup	Recall <i>unchecked</i>

#### 4. CONFIGURATION UTILITY

The eDMX Configuration utility provides a simple interface to all device parameters. Windows version 1.12 and above is compatible with LeDMX4 PRO devices however we highly recommend using the latest version and updating firmware as well. OS X version 1.4+ is recommended for LeDMX4 PRO but may lag behind the Windows version when new features are added.

Typically, parameters are set once during initial configuration and left untouched. If you are not confident in setting up network IP Address, Subnet Mask and Default Gateway parameters please get in touch with DMXking.com support and we'll walk you through the process. DHCP is supported from firmware v2.6 onwards.

**IMPORTANT:** Once you've finished configuring your eDMX product close it before starting your lighting control application if it's running from the same computer. In general, only 1 Art-Net application will function at a time.



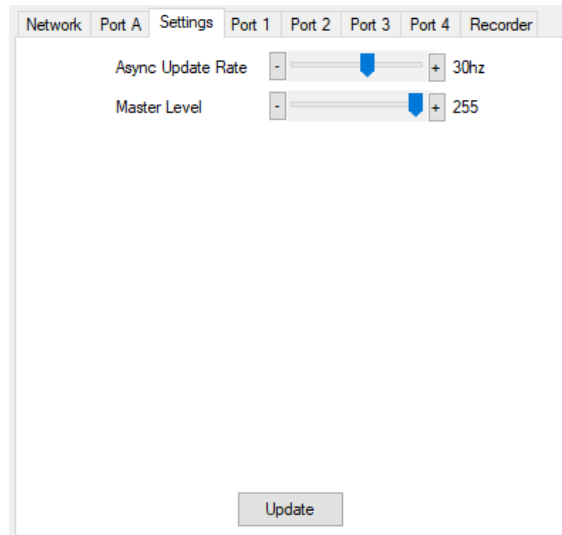
Before starting eDMX Configuration utility please ensure your computer has a static IPv4 network setting, for example IP 192.168.0.100 Subnet 255.255.255.0 Gateway 192.168.0.254.

Upon startup eDMX devices are automatically detected and displayed by IP address. You can re-poll for new devices or just check the communications is okay by clicking “Search For Devices”. From v1.16 polling is automatic every 8 seconds but can be disabled through the Advanced | Auto Device Poll menu option.

Click on the desired device’s IP address in the list and all Settings will be retrieved. Note that if no response is received the settings will be greyed out. An activity box shows both transmitted and received messages to help with diagnosing communication issues. If your network configuration has multiple adapters and or multi-homing you need to select the same network range as the eDMX from the Network Adapter IP Address dropdown box and also ensure the subnet mask is appropriate. Make changes to the applicable settings on the Network tab then click “Update Network Settings”.

Selecting “Firmware Update” will prompt for an appropriate firmware file and upload upon confirmation. A built in boot loader permits updating of the LeDMX4 PRO firmware. Note only signed encrypted firmware files from DMXking.com can be successfully loaded to ensure you won’t brick your device by accident. Future firmware releases for this product will be in the form 0106-500-VersionMajor.VersionMinor.enc

## SETTINGS TAB – FIRMWARE 3.3+



Make changes as required then click “Update” to save settings in your LeDMX4 PRO unit.

The following table explains each of the settings parameters.

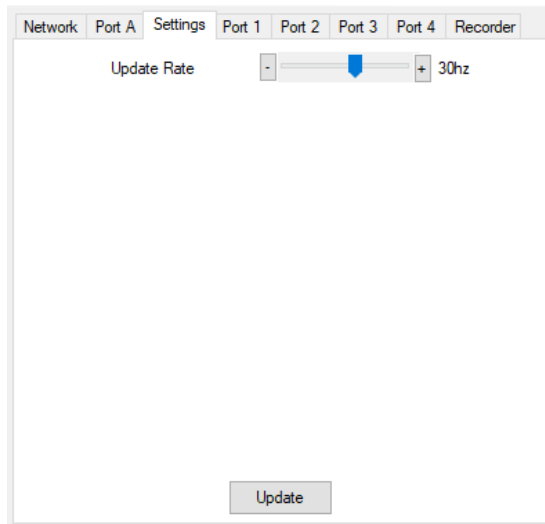
Parameter	Usage
Update Rate	Frequency LED strip receives updates from Incoming Universe data. Universe Sync takes precedence.
Master Level	Pixel output master level control for all outputs. Has no effect for Raw Colour Order modes and is overridden by Playback Universe Master Level (see Recorder Manual).

From firmware v3.1+ pixel mapping mode and universe usage are inferred from the pixel port settings so there is no longer any need to specify these parameters separately and are excluded from the Settings tab accordingly in newer versions of eDMX Configuration.

From firmware v3.1+ universe synchronization modes are automatically activated upon receiving sACN Universe Sync, ArtSync or Madrix Post Sync packets. Because of the inherent incompatibility between these synchronization schemes it is up to the user to ensure only 1 is present on the network.

Firmware 3.3+ includes a Master Level control. With APA102 (a.k.a. APA101, SK9822) pixel types the 5bit pre-output current control is used for Master Level. All other pixel types are computed from channel levels \* master level resulting in a resolution loss at lower levels. Use UCS8903 or UCS8904 16 bit pixels for better control of low output levels.

## SETTINGS TAB – FIRMWARE 3.1+



Make changes as required then click “Update” to save settings in your LeDMX4 PRO unit.

The following table explains each of the settings parameters.

Parameter	Usage
Update Rate	Frequency LED strip receives updates from Incoming Universe data. Universe Sync takes precedence.

From firmware v3.1+ pixel mapping mode and universe usage are inferred from the pixel port settings so there is no longer any need to specify these parameters separately and are excluded from the Settings tab accordingly in newer versions of eDMX Configuration.

From firmware v3.1+ universe synchronization modes are automatically activated upon receiving sACN Universe Sync, ArtSync or Madrix Post Sync packets. Because of the inherent incompatibility between these synchronization schemes it is up to the user to ensure only 1 is present on the network.

## SETTINGS TAB – FIRMWARE 3.0 AND EARLIER

If your settings tab looks like this it's time to update firmware. Download the latest eDMX Configuration Utility and perform the update!

The screenshot shows the 'Settings' tab of the eDMX Configuration Utility. At the top, there are tabs for 'Network', 'Port A', 'Settings', 'Port 1', 'Port 2', 'Port 3', 'Port 4', and 'Recorder'. The 'Settings' tab is active. Below the tabs, there are three main settings:

- Update Rate:** A slider control set to 30Hz.
- Synchronization Mode:** A dropdown menu set to 'None'.
- Pixel Mapping Mode:** A dropdown menu set to 'RGB 1 Universe'.

Below these settings is a section titled 'Incoming sACN / Art-Net Universes'. It contains a table with 16 rows, each representing a channel. Each row has two columns: 'sACN' and 'Art-Net 3'. The 'sACN' column has 8 input fields (1-8) and the 'Art-Net 3' column has 8 input fields (00-07). Below the table is an 'Update' button.

Make changes as required then click “Update” to save settings in your LeDMX4 PRO unit.

The following table explains each of the settings parameters.

Parameter	Usage
Update Rate	Frequency LED strip receives updates from Incoming Universe data. Universe Sync takes precedence.
Synchronization Mode	This setting is deprecated from v3.0 firmware onwards. Universe sync now occurs automatically if Art-Net Sync, sACN Universe Sync, or Madrix Post Sync are present on the network.
Pixel Mapping Mode	RGB pixel mapping to DMX512 data. Raw 1U   Raw 2U   RGB remap 1U   RGB remap 2U   Full mapping with group size, zigzag and direction. Of note full mapping of 340 pixels may actually span 3 universes depending on the start channel and pixel count.
Incoming Universes	These 16 universes are a filtering mechanism. All universes mapped to Ports must be included otherwise data won't be received. Note when sACN Universe > 32767 is specified Art-Net wraps back to universe 00:0:0 again.

Raw 1U/2U or RGB 1U/2U Pixel Mapping Modes are recommended unless your software package is not capable of re-mapping pixel locations. Most packages are now capable of this functionality which reduces processing requirements on the LeDMX4 PRO itself.

The screenshot shows the configuration utility for Port 1. The settings are as follows:

- Pixel Type: UCS8904
- Pixel Count: 256
- Null Pixels: 0
- Colour Order: RGBW 16bit
- Start Universe: 1

Full Mapping Options:

- Start Channel: 1
- Pixel Group Size: 1
- ZigZag: 0
- Direction:  Reverse

Buttons: Disable Full Mapping

Note: Click Update under Settings tab to apply

Make changes as required then click “Update” in the Settings Tab to save settings in your LeDMX PRO unit. The Disable Full Mapping button returns Start Channel, Pixel Group Size, ZigZag and Direction to defaults that ensure Full Mapping mode is not activated in firmware v3.1+. Firmware v3.0 required explicit setting of Full Mapping mode through the Settings tab whereas v3.1+ uses an automatic detection based on these parameters.

Not all Pixel Types and Color Orders are implemented in earlier firmware versions. The configuration utility will let you select an unsupported type but it will revert to a default if unsupported. We highly recommend using the latest firmware and configuration utility releases.

### Firmware 3.3+

Parameter (3.3+)	Usage
Pixel Type	Must match your connected Pixel type. There are clock speed options for many pixel types and we recommended slower rates for longer cable runs.
Pixel Count	Number of physical pixels in the string. Maximum depends on number of channels per pixel which depends on the Color Order setting. RGB = 680, RGBW = 512, 2ch = 1024, 1ch = 2048, Raw I+3ch = 512, RGB 16bit = 340, RGBW 16bit = 256.
Null Pixels	Number of pixels to ignore at the start of the pixel strip. Minimum 0. Maximum 16. Commonly used to extend the drive distance from source to the first active pixel.
Color Order	DMX channel mapping to pixel elements. RGB, RBG, GRB, GBR, BRG, BGR, raw 1/2/3/4/5ch, 2ch swapped, RGBW, WRGB, WRBG, GRBW, Raw I+3ch, Raw 3ch 16bit, Raw 4ch 16bit, RGB 16bit, RGBW 16bit.
Start Universe	sACN/Art-Net Universe number pixels are mapped to.
Start Channel	DMX512 channel number pixel data starts from. Only RGB/3ch pixels supported.

Pixel Group Size	Multiple sequential pixels can be mapped to an RBG/3ch DMX channel group. Only RGB/3ch pixels supported. Maximum group size 255.
Zig Zag	Reverses pixel direction every N RGB/3ch pixels. Only RGB/3ch pixels supported.
Direction	Reverse makes pixel 1 appear at the far end of the RGB strip. Only RGB/3ch pixels supported.

### **Firmware 3.1+**

<b>Parameter (3.1+)</b>	<b>Usage</b>
Pixel Type	Must match your connected Pixel type. There are clock speed options for many pixel types and we recommended slower rates for longer cable runs.
Pixel Count	Number of physical pixels in the string. Maximum depends on number of channels per pixel which depends on the Color Order setting. RGB = 680, RGBW = 512, 2ch = 1024, 1ch = 2048.
Null Pixels	Number of pixels to ignore at the start of the pixel strip. Minimum 0. Maximum 16. Commonly used to extend the drive distance from source to the first active pixel.
Color Order	DMX channel mapping to pixel elements. RGB, RBG, GRB, GBR, BRG, BGR, raw 1/2/3/4/5ch, 2ch swapped, RGBW, WRGB, WRBG, GRBW.
Start Universe	sACN/Art-Net Universe number pixels are mapped to.
Start Channel	DMX512 channel number pixel data starts from. Only RGB/3ch pixels supported.
Pixel Group Size	Multiple sequential pixels can be mapped to an RBG/3ch DMX channel group. Only RGB/3ch pixels supported. Maximum group size 255.
Zig Zag	Reverses pixel direction every N RGB/3ch pixels. Only RGB/3ch pixels supported.
Direction	Reverse makes pixel 1 appear at the far end of the RGB strip. Only RGB/3ch pixels supported.

### **Firmware 3.0 and earlier**

<b>Parameter (3.0 and lower)</b>	<b>Usage</b>
Pixel Type	Must match your connected Pixel type. There are clock speed options for many pixel types and we recommended slower rates for longer cable runs.
Pixel Count	Number of physical RGB pixels in the string (i.e. 1 pixel = R+G+B 3 channels). Maximum 340.
Null Pixels	Number of pixels to ignore at the start of the pixel strip. Minimum 0. Maximum 16. Commonly used to extend the drive distance from source to the first active pixel.
Color Order	DMX channel mapping to pixel RGB elements. RGB, RBG, GRB, GBR, BRG, BGR. This parameter is ignored when Raw 1U or Raw 2U mode is selected.
Start Universe	sACN/Art-Net Universe number pixels are mapped to. Note you must include this universe in your Incoming sACN/Art-Net universe table as well.
Start Channel	DMX512 channel number pixel data starts from. This parameter is ignored when Raw 1U, Raw2U, RGB 1U and RGB 2U mode is selected.

Pixel Group Size	Multiple sequential pixels can be mapped to an RGB DMX channel group. Only used with Full Mapping mode. Maximum group size 255.
Zig Zag	Reverses pixel direction every N pixels. Only used with Full Mapping mode.
Direction	Reverse makes pixel 1 appear at the far end of the strip. Only used with Full Mapping mode.

Some examples of Full Mapping from source DMX512 data ch1 = Full (Pixel 1 Red), ch14 = Full (Pixel 5 Green). Port 1 configured with Pixel Count = 12, Null Pixels = 0, Start Universe = 1, Start Channel = 0.



Pixel Group Size = 1



Pixel Group Size = 2



Reverse Order. Pixel Group Size = 1



The screenshot shows the 'Port A Settings' window with the following configurations:

- ArtNet Settings:** Async Update Rate is set to 40hz, and Broadcast Threshold is set to 10.
- Merge Mode:** 'Highest Takes Priority (HTP)' is selected. 'Latest Takes Priority (LTP)' and 'Timeout all sources' are unselected.
- Operation Mode:** 'DMX Out' is selected. 'DMX In Art-Net' and 'DMX In sACN' are unselected.
- RDM Settings:** Discovery Period is set to 0s, and Packet Spacing is set to 1 1/20s.
- Recall DMX snapshot at startup:** This checkbox is unselected.
- Snapshot DMX:** A button is present.
- Update:** A button is present.
- Universe:** Set to 1.
- Art-Net Port-Address:** Set to 00 0 0.

Operation Mode: DMX Out

The screenshot shows the 'Port A Settings' window with the following configurations:

- ArtNet Settings:** Async Update Rate is set to 40hz, and Broadcast Threshold is set to 10.
- Merge Mode:** 'Highest Takes Priority (HTP)' is selected. 'Latest Takes Priority (LTP)' and 'Timeout all sources' are unselected.
- Operation Mode:** 'DMX In sACN' is selected. 'DMX In Art-Net' and 'DMX Out' are unselected.
- Fixed IP:** A text field contains '0.0.0.0'.
- RDM Settings:** sACN Priority is set to 100, and Packet Spacing is set to 1 1/20s.
- Recall DMX snapshot at startup:** This checkbox is unselected.
- Snapshot DMX:** A button is present.
- Update:** A button is present.
- Universe:** Set to 1.
- Art-Net Port-Address:** Set to 00 0 0.

Operation Mode: DMX In sACN with sACN Priority 100

DMX512 ports can be configured as either DMX Out, with automatic dual sACN/Art-Net protocol support, or DMX In, with manually selected sACN or Art-Net protocol. When configured as DMX In a single Fixed IP address destination may be specified but in the majority of applications leaving this field at 0.0.0.0 is appropriate.

Make changes to the applicable Port settings then click "Update".

Parameter	Usage
Operation Mode	DMX IN Art-Net, DMX IN sACN, DMX OUT (both Art-Net and sACN are enabled). Fixed IP is 0.0.0.0 by default which equates to multicast sACN or automatic unicast/broadcast Art-Net. Setting a Fixed IP forces DMX IN unicast to 1 IP only.
DMX Universe	sACN 1-63999 which is translated to an Art-Net Port-Address (Net:Sub:Uni). Setting DMX Universe = 1 results in sACN Universe = 1 and Art-Net 00:0:0 (Universe 1 = Art-Net Universe 0)
Merge Mode	HTP (Highest Takes Precedence - dimmers), LTP (Last Takes Precedence – moving lights). Timeout all sources: Last Art-Net or sACN stream source if lost will timeout DMX output.
Update Rate	DMX512 output frame rate/frequency. Universe Sync takes precedence.
RDM Packet Spacing	Number of 1/20sec intervals enforced minimum between RDM messages on DMX line
RDM Discovery Period (TX) / sACN Priority (DMX IN mode)	Number of seconds between internally initiated RDM Discovery attempt. Setting Discovery Period = 0s will <b>disable RDM</b> which is the default. In DMX IN mode – sACN Priority 0 – 200.
Broadcast Threshold	0 = Force Art-Net broadcast mode, > 0 Art-Net II/3/4 unicast.
Recall DMX snapshot at startup	Recall snapshot scene at power on and output until Art-Net or sACN source received. Snapshot DMX button records current DMX output to snapshot memory.

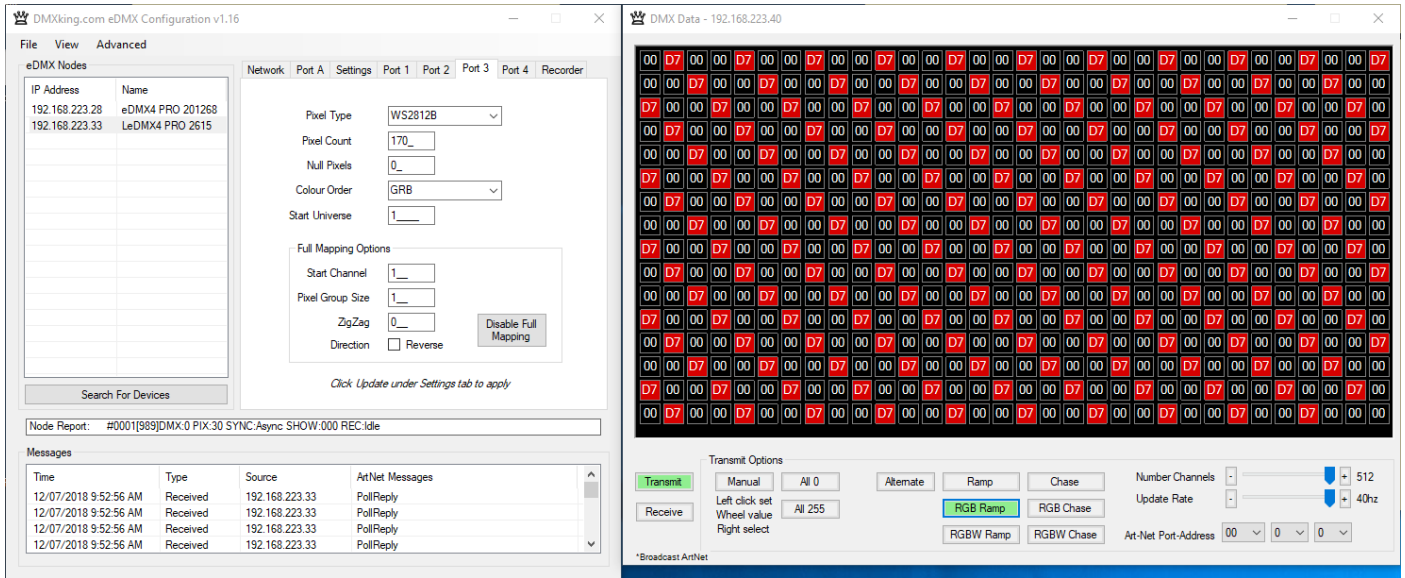
Network	Port A	Settings	Port 1	Port 2	Port 3	Port 4	Recorder		
<div style="border: 1px solid gray; padding: 5px;"> <div style="border-bottom: 1px solid gray; padding-bottom: 5px;"> <b>Controls</b>  <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <div style="flex: 1;"> <input type="text" value="Show 1"/> </div> <div style="flex: 1;"> <input type="button" value="Play"/> <input type="button" value="Stop"/> </div> </div> <div style="display: flex; justify-content: space-between; align-items: flex-start; margin-top: 5px;"> <div style="flex: 1;"> <b>Controls Scope</b>  <input checked="" type="radio"/> Selected <input type="radio"/> Broadcast                 </div> <div style="flex: 1;"> <input type="button" value="Record"/> <input type="checkbox"/> Enable                 </div> </div> </div> <div style="padding: 5px;"> <b>Settings</b> <table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; vertical-align: top;"> <input type="checkbox"/> Playback Enable  <input type="checkbox"/> Recorder Enable  <input type="checkbox"/> Playback Merge  <input type="checkbox"/> Record Monitor  <input type="checkbox"/> Record Trigger Uni / Ch  <input type="checkbox"/> Playback Trigger Universe  <input type="checkbox"/> Playback Universe Master Level  <input type="checkbox"/> Playback External Trigger  <input type="checkbox"/> Hold Last Scene  <input type="checkbox"/> Last Show Recall                 </td> <td style="width: 50%; vertical-align: top;"> <div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px;"> <b>TFTP</b>  <input type="checkbox"/> Read Access  <input type="checkbox"/> Write Access  <input type="text" value="0.0.0.0"/> Client IP                 </div> <div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> <input type="text" value="1"/> <input type="text" value="00"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="1"/> </div> <div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> <input type="text" value="17"/> <input type="text" value="00"/> <input type="text" value="1"/> <input type="text" value="0"/> </div> <div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> <input type="checkbox"/> Up/Down/Go                 <input type="checkbox"/> Broadcast             </div> <div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> <input type="checkbox"/> B/O Show After Stop                 <input type="checkbox"/> Multicast Output             </div> <div style="text-align: right;"> <input type="button" value="Update"/> </div> </td> </tr> </table> </div> </div>								<input type="checkbox"/> Playback Enable <input type="checkbox"/> Recorder Enable <input type="checkbox"/> Playback Merge <input type="checkbox"/> Record Monitor <input type="checkbox"/> Record Trigger Uni / Ch <input type="checkbox"/> Playback Trigger Universe <input type="checkbox"/> Playback Universe Master Level <input type="checkbox"/> Playback External Trigger <input type="checkbox"/> Hold Last Scene <input type="checkbox"/> Last Show Recall	<div style="border: 1px solid gray; padding: 2px; margin-bottom: 5px;"> <b>TFTP</b>  <input type="checkbox"/> Read Access  <input type="checkbox"/> Write Access  <input type="text" value="0.0.0.0"/> Client IP                 </div> <div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> <input type="text" value="1"/> <input type="text" value="00"/> <input type="text" value="0"/> <input type="text" value="0"/> <input type="text" value="1"/> </div> <div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> <input type="text" value="17"/> <input type="text" value="00"/> <input type="text" value="1"/> <input type="text" value="0"/> </div> <div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> <input type="checkbox"/> Up/Down/Go                 <input type="checkbox"/> Broadcast             </div> <div style="display: flex; justify-content: space-between; margin-bottom: 5px;"> <input type="checkbox"/> B/O Show After Stop                 <input type="checkbox"/> Multicast Output             </div> <div style="text-align: right;"> <input type="button" value="Update"/> </div>
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Please refer to the eDMX PRO Recorder manual for more information. This functionality is common to all eDMX PRO, LeDMX PRO and ultraDMX2 PRO devices.

## DMX DISPLAY FUNCTION

Select **View | DMX Display** for a simple DMX512 test utility. To generate an Art-Net output stream click Transmit then select one of the 10 Transmit Options and change Art-Net Universe as applicable. When in Manual mode you can click on any of the channels (represented by small boxes with hexadecimal channel level inside) to set ON level and double click to set zero. The mouse scroll wheel adjusts a channel by a defined increment. Channel number increases left to right, top to bottom and the roaming tool tip provides information about a specific channel.

Both the ON level and mouse wheel step can be set by right clicking anywhere within the black display area. Number of channels transmitted and the refresh rate can be adjusted using the applicable sliders adjacent to transmit options.



The DMX Display utility works with any manufacturers Art-Net hardware and can be useful for diagnostics and simple testing of DMX512 fixtures. In Receive mode only Art-Net I broadcast traffic is supported. To display channel data from an eDMX/LeDMX DMX-In port you must configure Broadcast Threshold to 0 otherwise Art-Net messages will be unicast.

## NODE REPORT

Node Report: #0001[1022]DMX:0 PIX:30 SYNC:Async SHOW:000 REC:Idle

From firmware v3.3+ each node provides a brief status report indicating DMX frame rates, PIXel output rate, SYNC status, SHOW playback selection and REcorder status.

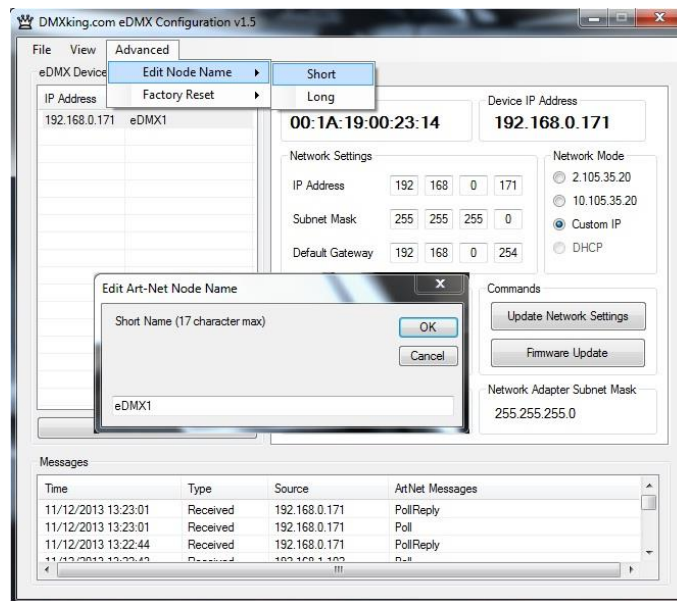
Above an LeDMX4 PRO reports Port A at 0fps, Pixel output at 30fps with no synchronization present (Async mode) and the recorder state Idle.

## ADVANCED OPTIONS

IGMP Unsolicited Period can be configured where an IGMP Querier is not always active in a multicast (sACN) network. We highly recommend ensuring your network infrastructure manages IGMP Requests appropriately however setting the IGMP Unsolicited Period from 5 – 255 seconds permits multicast traffic to function correctly even when the IGMP Querier is off-line. Set to 0s to disable (default). This is only available in firmware 3.0+ and can be accessed using the **Advanced | IGMP Unsolicited Period** dialog.

## ART-NET NODE NAME

The Art-Net protocol supports device naming which can make larger installations more manageable. Both Short Name (17 characters) and Long Name (63 characters) for an LeDMX Device can be modified using the **Advanced | Edit Node Name** dialog.



## FACTORY RESET

This is a last resort option if for whatever reason incorrect or forgotten device network settings have rendered your device unusable. A word of warning – this function will factory reset **\*ALL\*** eDMX devices on your network so it's critical to separate off the device requiring reset. We recommend directly connecting a computer and eDMX device using a crossover cable so there's no chance of additional eDMX devices accidentally being reset too.

Several warnings are presented before the command is sent. This function is not intended for use with eDMX/LeDMX PRO and ultraDMX2 PRO devices and will not have any effect in firmware 3.0+.

## 5. PORTS, MERGING, PRIORITY AND DMX INPUT

### PORTS AND MERGING

eDMX Products are capable of several advanced merging and stream selection functions usually only found on high priced equipment. Support for both HTP (Highest Takes Precedence) and LTP (Latest Takes Precedence) merging of 2 sources producing a single DMX512/pixel universe output thus permitting 2 controllers to co-exist for 1 lighting rig. To achieve DMX stream merging simply send 2 Art-Net or sACN streams with the same Universe ID and configure the applicable merge scheme HTP or LTP. If the number of sources exceeds 2 only the first 2 will be processed and all others are dropped. Possible merging sources are:

Source	Notes
Art-Net I, II, 3 or 4	Priority 100 is assigned to permit Art-Net + sACN merge/priority functionality.
sACN / E1.31	Only sACN sources of the same Priority will be HTP or LTP merged.
DMX In Art-Net	Configure DMX In port universe to the same as a Pixel universe. Priority is 100.
DMX In sACN	Configure DMX In port universe to the same as a Pixel universe. Priority is defined by the Discovery Period slider (values of 0-200 valid).

## SUPPORTED MERGING COMBINATIONS

Source 1	Source 2	Notes
Art-Net	Art-Net	Sources are timed out 3 seconds after last received frame.
sACN / E1.31	sACN / E1.31	Sources will end immediately upon sACN stream termination flag, otherwise 3 second timeout after last received frame.
Art-Net	sACN / E1.31	Art-Net source timed out 3 seconds after last received frame, sACN stream termination flag otherwise 3 second timeout after last received frame.
DMX IN	Art-Net	Merge external DMX512 source (i.e. console) with incoming Art-Net stream.
DMX IN	sACN / E1.31	Merge external DMX512 source (i.e. console) with incoming sACN stream.

## SACN / E1.31 PRIORITY

At any time if a higher priority sACN stream is received it will take over control a DMX Out channel / Pixel Universe regardless of other incoming streams or merging. When an sACN stream is stopped gracefully via a stream terminate message the eDMX port / Pixel Universe will immediately revert to whatever other sources are present, otherwise the default stream timeout of 3 seconds applies. If you want to merge 2 sACN streams together they must be of the same priority.

## SACN / E1.31 PRIORITY – DMX RECEIVE

When a port is configured for DMX IN sACN operation the RDM Discovery Period parameter doubles up as sACN Priority since it is otherwise unused. This permits DMX Inputs to generate sACN multicast or unicast streams with a specific priority.

## DMX512 IN – UNICAST / BROADCAST / MULTICAST

When you feed a DMX512 signal into an eDMX Port configured as **DMX IN Art-Net** the following will determine Art-Net unicast or broadcast:

1. If Broadcast Threshold = 0 the frame is always broadcast on the IP subnet.
2. If Broadcast Threshold > 0 and number of detected Art-Net II/3/4 devices "subscribed" to that universe is less than the threshold the frame is unicast to each device.
3. If Broadcast Threshold > 0 and the number of detected Art-Net II/3/4 devices "subscribed" to that universe is greater than the threshold the frame is broadcast on the subnet.
4. If Broadcast Threshold > 0 and zero Art-Net II/3/4 devices are "subscribed" to that universe the frame is broadcast on the subnet.
5. If Fixed IP is not 0.0.0.0 the frame is only unicast to the specified IPv4 address.

As you can see there are multiple ways broadcast could occur. The implementation is done like this to ensure compatibility with mixed Art-Net I/II/3/4 device networks but still permit unicast only when Art-Net II/3/4 devices are used exclusively.

For **DMX IN sACN** multicast frames will be generated when Fixed IP is 0.0.0.0 otherwise frames are unicast to the specified destination.

## 6. COMPATIBLE SOFTWARE

Art-Net/sACN and DMX512 are the most commonly used lighting control protocols with roots in simple theatrical light dimming. These days almost any lighting or stage effect equipment may be controlled using DMX512 including LED pixels.

The DMXking.com LeDMX4 PRO unit is a 4 Pixel Output + 1 DMX512 sACN/Art-Net device designed for use with computer-based show control and effect software.

Check the following page for a short list of compatible software:

<http://dmxking.com/control-software>

## 7. TECHNICAL SPECIFICATIONS

- Dimensions: 64x68x30mm (WxDxH).
- Weight: 80grams.
- Power input 5Vdc or 12-24Vdc depending on model purchased.
- Control electronics power requirements: 5Vdc @ 200mA (or 12-24Vdc @ 150mA max for 12V model)
- Maximum continuous current per output 5A.
- Buffered 5V Clock and Data lines.
- WS2811, WS2812, WS2812B, WS2813, UCS1903, UCS2912, UCS8903, UCS8904, PL9823, TM1934, APA101, APA102, SK9822, APA104, APA106, INK1002, INK1003, SM16703, SK6812, WS2801, LPD6803, LPD8806 pixel types and equivalents supported. Note many pixels are actually the exact same protocol timing as those listed. Check with DMXking support.
- Fast 800kHz and slow 400kHz data rates supported for WS2811 / APA104.
- SPI pixels can be clocked at 500kHz, 1MHz, 2MHz and 4MHz
- Up to 680 RGB pixels / 4 DMX universes per output.
- Art-Net, Art-Net II, Art-Net 3, Art-Net 4 and sACN/E1.31 support.
- Universe Sync Art-Net, sACN and Madrix Post Sync.
- Both HTP and LTP merging of 2 Art-Net/sACN streams on Port A
- HTP merging of 2 Art-Net/sACN streams on Pixel ports
- sACN Priority
- IPv4 Addressing
- IGMPv2 for multicast network management
- Ethernet 10/100BaseT.

## 8. WHERE DO I BUY LED PIXELS?

There are *many* sources for LED pixels in strip and other formats. Pretty much all of it comes out of China and it can be more cost effective to source through sites such as Aliexpress which provide individual item sales without much fuss.

Try these Aliexpress stores:

- <https://kinggreen.aliexpress.com/store/713947>
- <https://www.aliexpress.com/store/701799>

## 9. FREQUENTLY ASKED QUESTIONS

Q: Does DMXking recommend any particular type of pixels or control ICs?

A: We prefer APA102/SK9822 pixels because they have a higher clocking rate and an additional 5bit master current control.

Q: How big should my power supply be?

A: It depends on the pixel count, output intensity, and how many pixels will be lit simultaneously. Often power supplies are oversized when calculations are done assuming all pixels might be on at full intensity. There is no straight answer and per pixel current consumption should be ascertained from the product datasheet.

Q: Why do my pixels start going pink instead of white further along the strip?

A: What's happening is the power supply voltage is dropping and generally blue LEDs will drop in current first since they have the highest forward voltage. This is simply  $V=IR$  and different strips will exhibit different results because their conductor resistance might be higher/lower. By injecting power again (from the same power supply or another power supply) along the strip at intervals it is possible to mitigate the voltage drop effects. Higher voltage strips/pixels (12V or 24V) are usually less susceptible to color fade issues.



Q: Can I use my LeDMX4 PRO 5V unit to run 12V pixels?

A: Yes but you'll need 2 power supplies. The first, a 5Vdc unit, powers only the LeDMX4 PRO unit. The second, a 12Vdc unit, powers only the LED pixels. Connect only DA/CLK and GND between the LED pixels and LeDMX4 PRO unit. Do not connect to V+ on the output connectors!

Q: Is it possible to control pixel outputs from DMX512 rather than Art-Net/sACN over the network?

A: Yes but there's only 1 DMX512 port and thus 1 DMX Universe available so you're constrained in how many pixels can be controlled. Of course using Full Mapping mode with >1 Pixel Group size it's possible to stretch that 1 universe a little further. Just configure Port A as DMX-In sACN on the same universe you've configured a pixel output.

Q: The power supply I purchased has exposed AC input terminals. Is this safe?

A: No. Unless you are suitably qualified please defer all AC mains wiring to applicable professionals. Safety first.

Q: My question doesn't appear here.

A: Ask our technical support people. Maybe it'll appear in the next user manual too.

## 10. WARRANTY

### DMXKING.COM HARDWARE LIMITED WARRANTY

#### What is covered

This warranty covers any defects in materials or workmanship with the exceptions stated below.

#### How long coverage lasts

This warranty runs for one year from the date of shipment from an authorized DMXking.com distributor.

#### What is not covered

Failure due to operator error or incorrect application of product. Opening the unit voids the warranty.

#### What DMXking.com will do

DMXking.com will repair or replace, at its sole discretion, the defective hardware. Return shipping costs from our service facility in New Zealand shall be free of charge.

#### How to obtain service

Contact DMXking.com directly by email [sales@dmxking.com](mailto:sales@dmxking.com)

## 11. DECLARATIONS (FCC & CE)

### FEDERAL COMMUNICATIONS COMMISSION (FCC) DECLARATION OF CONFORMITY

Responsible Party: JPK Systems Limited

DMXking.com • JPK Systems Limited • New Zealand  
0106-700-1.3

PO Box 493  
Pukekohe 2340  
New Zealand

declares that the product LeDMX4 PRO complies with Part 15 of the FCC rules.

Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a class B digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

## EEC DECLARATION

We

JPK Systems Limited  
PO Box 493  
Pukekohe 2340  
New Zealand

declare under our sole responsibility that our product LeDMX4 PRO conforms to the requirements of Council Directives 89/336/EEC and 73/23/EEC and therefore complies with the requirements of Council Directive 73/23/EEC, (The Low Voltage Directive) on the harmonization of the laws of Member States relating to electrical equipment designed for use within certain voltage limits as amended by Article 13 of Council Directive 93/68/EEC

- EN 55103-1
- EN 55103-2
- EN 60065

Signed: Jason Kyle

Date: 22 December 2015

Position: Managing Director