DMXking.com

LeDMX4 MAX

USER MANUAL

DMXking.com • JPK Systems Limited • New Zealand
0129-700-4.7

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1. INTRODUCTION

Thanks for purchasing a DMXking product. Our aim is to bring you high quality products with great features we know you'll appreciate. DMXking MAX series devices are Art-Net and sACN/E1.31 protocol compatible designed for use with computer based show control software or expansion of lighting console outputs. There are many free and commercial software packages available. http://dmxking.com/control-software

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/string/array. Although the LeDMX4 MAX can only provide up to 8A 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 MAX product variants. Check the product label for P/N details.

Part Number	Feature addition
0129-1.0	Initial product release

Errata P/N 0129-1.0: Button S1 is marked FORCE B/L and S2 is marked FACTORY RESET. Functions are swapped. Use FORCE B/L for FACTORY RESET.

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
V4.0	Initial release. RDM support disabled.
V4.1	Improved port LED intensity. Fixed startup hang with certain SD cards.
V4.2	DMX-IN recording issue fix. ArtNet subnet broadcast traffic issue fix – resolves problem with being unable to scan for (L)eDMX MAX units.
V4.3	Initial release with USB DMX support.
V4.4	Extension to 6 universes per pixel port. Problem with I/O port triggering resolved, earlier firmware versions will not function correctly.
V4.5	Extensions to DMXking USB DMX protocol. Required update for USB DMX functionality.
V4.6	Art-Net TimeSync. ArtPollReply changed to single universe per message. Art-Net RDM functionality enabled. DMX512 timing parameters adjustable. Art-Net UDP Port adjustable. Art-Net RDM Controller optional fixed IP and adjustable UDP Port. Diagnostics messages priority enhancements.
V4.7	SD card detection improvements. HD108 pixel type added. APA102 master level from DMX channel smooth fading.

MAIN FEATURES

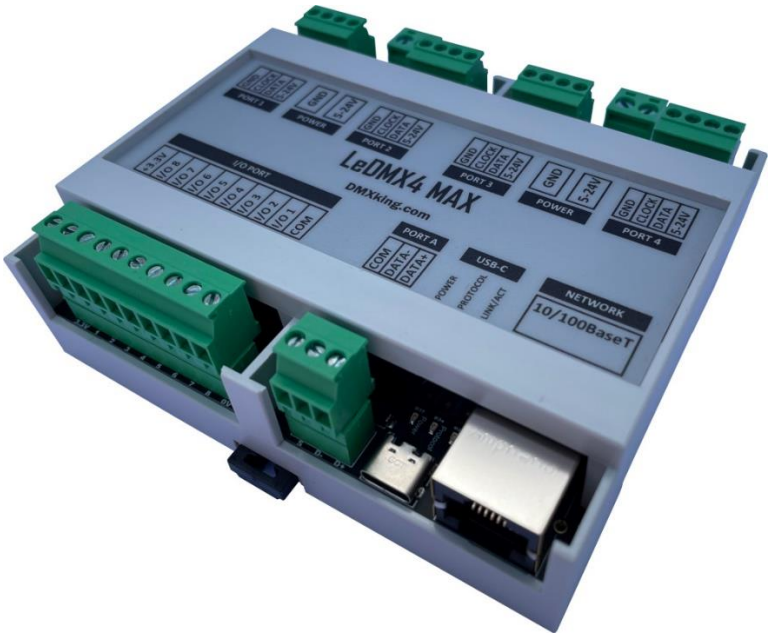
- Wide input power range 5-24Vdc.
- Power from USB-C (pixel power outputs excluded)
- USB DMX functionality in addition to Network ArtNet/sACN
- OEM board available for integration into your custom LED designs
- DIN rail and wall mount using built in clips
- Static or DHCP IPv4 network addressing
- Supported operating systems: Windows, MacOS, Linux, iOS, Android
- 4 Independent pixel output ports each with 8A supply capability
- 2 Independent DC power inputs
- 1x DMX512 IN/OUT port
- Directly drives WS2811, WS2812, WS2812B, WS2813, WS2815, WS2822S UCS1903, UCS2903, UCS2912, UCS8903, UCS8904, PL9823, TM1934, APA101, SK9822, APA102, APA104, APA106, APA107, NS107, INK1002, INK1003, SM16703, SK6812, WS2801, LPD6803, LPD8806, DMX512-P, HD108 and many more compatible LED strips
- Selectable clock/data rate to suit long cables or fast output
- Up to 1020 RGB pixels or 768 RGBW pixels per output spanning 6 DMX universes (4080 RGB pixels / 24 universes per LeDMX4 MAX)
- Up to 510 16bit RGB pixels or 384 16bit RGBW pixels per output
- Automatic RGB, RGBW color order correction or raw mapping options
- Per pixel intensity control for APA102/SK9822 utilizing the 5bit current pre-regulator
- Master Level control independent of incoming universe streams
- Flexible Full Mapping option for outputs permitting any start address and zig-zag corrections of RGB, RGB16, RGBW and RGBW16 pixel types
- Alternate Full Mapping and Master Level changeover with sACN Priority threshold
- Null pixel support for longer runs to first active pixel
- 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
- Recording and playback to microSD card (not included). See eDMX MAX Record / Playback manual
- Standalone show playback without computer or network connection
- Internal clock with optional battery backup for timed playback. NTP time sync.
- Configuration utility with basic Art-Net output/input test functionality

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 MAX can only provide up to 8A 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.

eDMX MAX translates Art-Net 00:0:0 to Universe 1 (i.e. offset by 1) so there is an easy mapping between sACN/E1.31 and Art-Net.

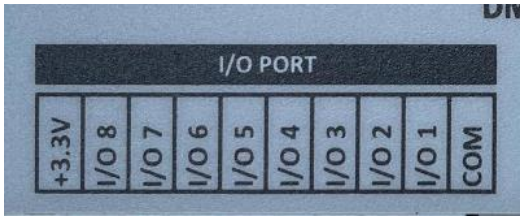
2. CONNECTIONS

LEDMX4 MAX

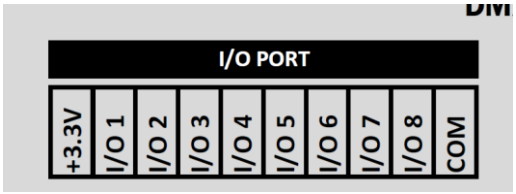


- DC Power Input x2 – Supply polarity marked on board. Note supply voltage is marked. Pay careful attention!
- Ethernet 10/100Mbps RJ45 socket
- 4x 4way 3.5mm pitch pluggable terminal blocks for pixel strip outputs. GND, Clock [CK], Data [DA], V+
- 1x 3way 3.5mm pitch pluggable terminal block for DMX512 port.
- 1x 10way 3.81mm pitch pluggable terminal block for I/O triggering. See eDMX MAX Recorder Manual.
- Warning not all pixel strips/products use the same wire color code. Double check the signal names match wire colors.

LEDMX4 MAX FRONT PANEL LABEL ERROR



Note earlier production units have incorrect I/O Port labelling where I/O 1 – 8 are flipped 8 – 1. Above image shows the incorrect label.



Corrected label is shown above.

STATUS LED TABLE

LED	Indication
Protocol	Protocol activity. Flash Red = Art-Net/sACN. Solid Red = Bootloader mode
Link/Act	Network activity. Green = Link, Flash = Traffic
Port 1	Pixel port 1 activity
Port 2	Pixel port 2 activity
Port 3	Pixel port 3 activity
Port 4	Pixel port 4 activity

3. USB DMX OPERATION

DMXking MAX series devices include USB DMX functionality alongside Ethernet lighting protocols ArtNet/sACN.

SOFTWARE COMPATIBILITY

Software packages for USB DMX use either a Virtual COM Port (VCP) driver or FTDI specific D2XX driver. DMXking MAX series uses VCP which is more universal than FTDI D2XX, especially across different operating systems, however this has created some compatibility issues with existing software packages using the later. We are working with software developers still using D2XX to encourage updating their code to utilize VCP instead and also leverage DMXking USB DMX protocol extensions that allow multiple universe operation.

Check https://dmxking.com/ for DMXking MAX series USB DMX compatible software list.

DEVICE CONFIGURATION

Previously DMXking USB DMX capable devices did not require DMX port configuration for DMX-IN mode as this was automatically selected by certain USB DMX messages. This has changed in DMXking MAX series devices which now require explicit DMX-OUT or DMX-IN port configuration along with selecting which port to forward over USB DMX to allow multi-port devices to function with complete flexibility.

DMX PORT MAPPING

Simple USB DMX protocol output messages are automatically mapped to the physical DMX512 ports regardless of configured universe.

USB DMX SERIAL NUMBER

For software compatibility reasons a BCD serial number is calculated from the MAX device hardware MAC address using the lower 3 hexadecimal bytes converted to a decimal number. Software that has been updated for MAX series devices will display the hardware MAC address.

4. DEFAULT CONFIGURATION

LeDMX4 MAX 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
IGMPv2 Unsolicited Report	*Unchecked*

Settings Tab

Parameter	**Default Setting**
Update Rate	30Hz - Universe Sync will override.
Master Level	255 – Full output intensity.
Alternate Master Level	255 – Full output intensity.
Alt. mapping priority threshold	0 – Alternate Mapping Disabled.

Port Tabs (1-4)

Parameter	**Default Setting**
Pixel Type	WS2811
Pixel Count	170
Null Pixels	0
Color Order	GRB
Primary Start Universe	1,2,3,4 (Ports 1,2,3,4 respectively)

Primary Start Channel	1
Primary Pixel Group Size	1
Primary ZigZag	0
Primary Direction	Normal (unticked)
Alternate Start Universe	1,2,3,4 (Ports 1,2,3,4 respectively)
Alternate Start Channel	1
Alternate Pixel Group Size	1
Alternate ZigZag	0
Alternate Direction	Normal (unticked)

Port Tab A (DMX512 port)

Parameter	**Default Setting**
Async Update Rate	40 [DMX512 frames per second]. Universe Sync will override.
Port Operation Mode	DMX-OUT
Timeout all sources	*Unchecked*
Channel Offset	0
Fixed IP	0.0.0.0 [Only for DMX IN – Unicast to 1 IP address only]
Merge Mode	HTP
Full DMX Frame	*Unchecked*
Broadcast Threshold	10 [Art-Net II/3/4 unicasting up to 10 nodes]. Set to 0 for Art-Net I broadcast on DMX IN ports.
Unicast IP [DMX-IN]	0.0.0.0
sACN Priority [DMX-IN]	100
RDM Discovery Period [DMX-OUT]	0s / RDM Disabled
RDM Packet Spacing [DMX-OUT]	1/20s
DMX-OUT Failsafe Mode	Hold Last
Recall DMX Snapshot at startup	*Unchecked*
DMX512 Universe	1 [Net 00, Subnet 0, Universe 0] Note: sACN Universe 1 = Art-Net 00:0:0

5. CONFIGURATION UTILITY

Download eDMX MAX Configuration Utility from https://dmxking.com/downloads-list

User manual for the utility https://dmxking.com/downloads/eDMX MAX Configuration Utility User Manual (EN).pdf

6. TECHNICAL SPECIFICATIONS

- Dimensions: 106mm x 90mm x 32mm (WxDxH).
- Weight: 140grams.
- Power input 5-24Vdc
- UCB-C power input – for control electronics only, no USB-C power routed to pixel ports.
- Control electronics power simultaneously sourced from USB-C, pixel port 1&2 power input, pixel port 3&4 power input.
- Control electronics power requirements: 5Vdc @ 200mA, 12Vdc @ 100mA.
- Maximum continuous current per output 8A
- Buffered 5V Clock and Data lines with over voltage fault protection
- WS2811, WS2812, WS2812B, WS2813, UCS1903, UCS2903, UCS2912, UCS8903, UCS8904, PL9823, TM1934, APA101, APA102, SK9822, APA104, APA106, APA107, INK1002, INK1003, SM16703, SK6812, WS2801, LPD6803, LPD8806, DMX512-P, P9813, GS8208, TM1814, TM1914A, TLS3001 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 1020 RGB pixels / 6 DMX universes per output
- Ethernet 10/100Mbps Auto MDI-X port
- 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
- Operating temperature -10°C to 50°C non-condensing dry environment

7. 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 effort.

Try these Aliexpress stores or direct from a manufacturer:

- https://kinggreen.aliexpress.com/store/713947
- https://www.aliexpress.com/store/701799
- http://www.shiji-led.com/Index/index.html

8. FREQUENTLY ASKED QUESTIONS

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

A: We highly recommend APA102/SK9822 pixels because they have a higher clocking rate and an additional 5bit master current control. This really helps with smooth fades at reduced Master Level.

Q: What is DMX512P? Is this DMX512?

A: Yes and No. Actually, more No than Yes. Someone thought it would be a good idea to use DMX512 signaling for pixel control but it really makes no sense and creates confusion because it's not a differential signal like real DMX512. Connect DMX512P pixels to the Pixel Ports only so the signal levels are appropriate.

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 over sized 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: What happened to the 5V and 12-24V LeDMX4 PRO versions?

A: These have been merged together in the new eDMX MAX product so there is no longer a supply option that works from 5V up to 24Vdc.

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: I'm use WS2813 pixels with dual signal wires. What should I connect to the LeDMX MAX pixel port?

A: Only the DATA IN wire from the pixel strip should be connect to DA on the LeDMX MAX. Do not connect the DATA OUT return wire to anything.

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 your distributor for technical support. Maybe it'll appear in the next user manual too.

9. 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 two years from the date of shipment from an authorized DMXking distributor.

What is not covered

Failure due to operator error or incorrect application of product.

What DMXking will do

DMXking will repair or replace, at its sole discretion, the defective hardware.

How to obtain service

Contact your local distributor https://dmxking.com/distributors

10. ACKNOWLEDGEMENTS

Art-Net™ Designed by and Copyright Artistic Licence

11. DECLARATIONS

The LeDMX4 MAX has been tested against applicable standards and certified compliant as below.

Standard	
IEC 62368-1	Audio/Video and ICTE Safety Requirements
IEC 55032	Radiated Emissions
IEC 55035	EMC Immunity Requirements
FCC Part 15	Radiated Emissions
RoHS 3	Restriction or Hazardous Substances

Certification	**Country**
CE	Europe
FCC	North America
RCM	New Zealand / Australia
UKCA	United Kingdom