



eDMX4 PRO Interface



USER MANUAL

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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.

This user manual covers features up to v3.5 firmware. Some functionality may not be available with earlier firmware versions.

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 eDMX4 PRO product variants. Check the product label for P/N details.

| Part Number | Feature addition |
|-------------|-------------------------|
| 0104-1.0 | Initial product release |

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 |
|------------------|---|
| v2.8 | Initial release |
| v2.10 | Merge fixes, DMX In fixes, Timeout for internal sources added. |
| v2.14 | ArtNet 4 support, DHCP + AutoIP, Merge engine improvements, RDM performance enhancements. |
| 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 | ArtNet 4 NodeReport messages with BindIndex, NodeReport status messages, Dynamic IGMP reporting based on current port configurations. |
| v3.3 | Record/playback enhancements. |
| v3.5 | CR+LF no longer required on last script line. |

MAIN FEATURES

- Static IP or DHCP network addressing.
- Supported operating systems: Any with Ethernet networking support. Windows, MAC OS, Linux, iOS, Android...
- eDMX4 PRO - 4x DMX512 Out or DMX512 In with Art-Net, sACN E1.31 and E1.20 RDM support
- Art-Net broadcast, Art-Net II,3 & 4 unicast, sACN/E1.31 Multicast and sACN Unicast support.
- Merge 2 incoming Art-Net/sACN streams per output channel with both HTP and LTP options
- Merge Art-Net/sACN + DMX input -> DMX output(s)
- Merge 2x DMX input -> DMX output(s)
- 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
- 1500V Isolation between every port
- Tough metal enclosure with multiple mounting options including 19" rack mount.
- Available with 3 pin or 5 pin XLR socket, no adapter purchase required.
- Power over Ethernet 802.3af compliant and etherCON for network connection.
- E1.11 Higher Protection Level "DMX512-A Protected" device.
- 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 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.

eDMX4 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. EXTERIOR VIEW

FRONT VIEW



Ethercon connector for power/network using 802.3af PoE switch or power injector. Higher power 802.3at switches/injectors will also work. Four female 3pin or 5pin XLR connectors for DMX512-A **input** or **output** function on each port.

Important Note: eDMX4 PRO requires either an 802.3af / 802.3at compliant network switch or PoE power injector. See DMXking.com product accessories.

STATUS LED TABLE

| LED | Indication |
|---------|--|
| Data | Protocol activity. Red = RX, Green = TX, Solid Orange @ startup = Boot loader mode |
| Network | Network activity. Green = Link, Flash = Traffic |
| A | DMX512 Port A. Green = TX, Red = RX |
| B | DMX512 Port B. Green = TX, Red = RX |
| C | DMX512 Port C. Green = TX, Red = RX |
| D | DMX512 Port D. Green = TX, Red = RX |

3. DEFAULT CONFIGURATION

All eDMX4 PRO units ship with default IP address settings. Please reconfigure for your requirements before use.

| Parameter | Default Setting |
|-----------------|-----------------|
| IP Address | 192.168.0.112 |
| Subnet Mask | 255.255.255.0 |
| Default Gateway | 192.168.0.254 |

DMX512 and Art-Net configuration parameters are also configured with default values.

| Parameter | Default Setting |
|---|--|
| Network Mode | Static IP address |
| *Operation Mode | DMX Out |
| *Fixed IP | 0.0.0.0 [Only for DMX IN – Unicast to 1 IP address only] |
| *DMX Universe | 1-4 [Net 00, Subnet 0, Universe 0-3] 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 (TX mode) / sACN Priority (RX mode) | 0s [RDM Disabled] |
| *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. |
| *Recall DMX Snapshot at startup | Recall <i>unchecked</i> |
| Recorder Tab | All options disabled/unchecked by default. TFTP Client IP 0.0.0.0 |

*These parameters are per port.

4. CONFIGURATION UTILITY

The eDMX Configuration utility provides a simple interface to all device parameters. Windows version 1.9+ and all OS X versions are compatible with eDMX4 PRO devices. Typically, these 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 v2.14 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.

NETWORK TAB

| IP Address | Name |
|----------------|------------------|
| 192.168.223.28 | eDMX4 PRO 201268 |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

| Time | Type | Source | ArtNet Messages |
|-----------------------|-------------|----------------|------------------|
| 12/07/2018 6:42:06 AM | Received | 192.168.223.28 | PollReply |
| 12/07/2018 6:42:04 AM | Transmitted | 192.168.223.40 | Poll |
| 12/07/2018 6:42:00 AM | Received | 192.168.223.28 | SettingsNewReply |
| 12/07/2018 6:42:00 AM | Transmitted | 192.168.223.40 | SettingsNew |

Before starting the eDMX Configuration utility please ensure your computer has appropriate IPv4 network settings, for example IP 192.168.0.100 Subnet 255.255.255.0 Gateway 192.168.0.254.

Upon startup eDMX devices on the same subnet 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 IP addresses 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 eDMX 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 0104-500-VersionMajor.VersionMinor.enc

The Port A - D tabs provide access to the DMX512 port parameters.

The screenshot shows the 'PORT TAB' configuration window with the following settings:

- ArtNet Settings:**
 - Update Rate: 40hz
 - Broadcast Threshold: 10
- Merge Mode:**
 - ☒ Highest Takes Priority (HTP)
 - ☐ Latest Takes Priority (LTP)
 - ☐ Timeout all sources
- Operation Mode:**
 - ☐ DMX In Art-Net
 - ☐ DMX In sACN
 - ☒ DMX Out
- RDM Settings:**
 - Discovery Period: 0s
 - Packet Spacing: 1 1/20s
 - ☐ Recall DMX snapshot at startup
 - Snapshot DMX button
- Universe:** 1
- Art-Net Port-Address:** 00 0 0
- Update** button

Operation Mode: DMX Out

The screenshot shows the 'PORT TAB' configuration window with the following settings:

- ArtNet Settings:**
 - Async Update Rate: 40hz
 - Broadcast Threshold: 10
- Merge Mode:**
 - ☒ Highest Takes Priority (HTP)
 - ☐ Latest Takes Priority (LTP)
 - ☐ Timeout all sources
- Operation Mode:**
 - ☐ DMX In Art-Net
 - ☒ DMX In sACN
 - ☐ DMX Out
- Fixed IP:** 0.0.0.0
- RDM Settings:**
 - sACN Priority: 100
 - Packet Spacing: 1 1/20s
 - ☐ Recall DMX snapshot at startup
 - Snapshot DMX button
- Universe:** 1
- Art-Net Port-Address:** 00 0 0
- Update** button

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 |
|---|---|
| MAC Address | Factory programmed Ethernet MAC address |
| IP Address | IPv4 network address |
| Subnet Mask | Subnet mask, typically 255.0.0.0, 255.255.0.0 or 255.255.255.0 for class A,B & C respectively |
| Default Gateway | Address of network gateway (router) for communications beyond local subnet |
| Network Mode | DHCP or Static IP |
| 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 disable RDM 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. |

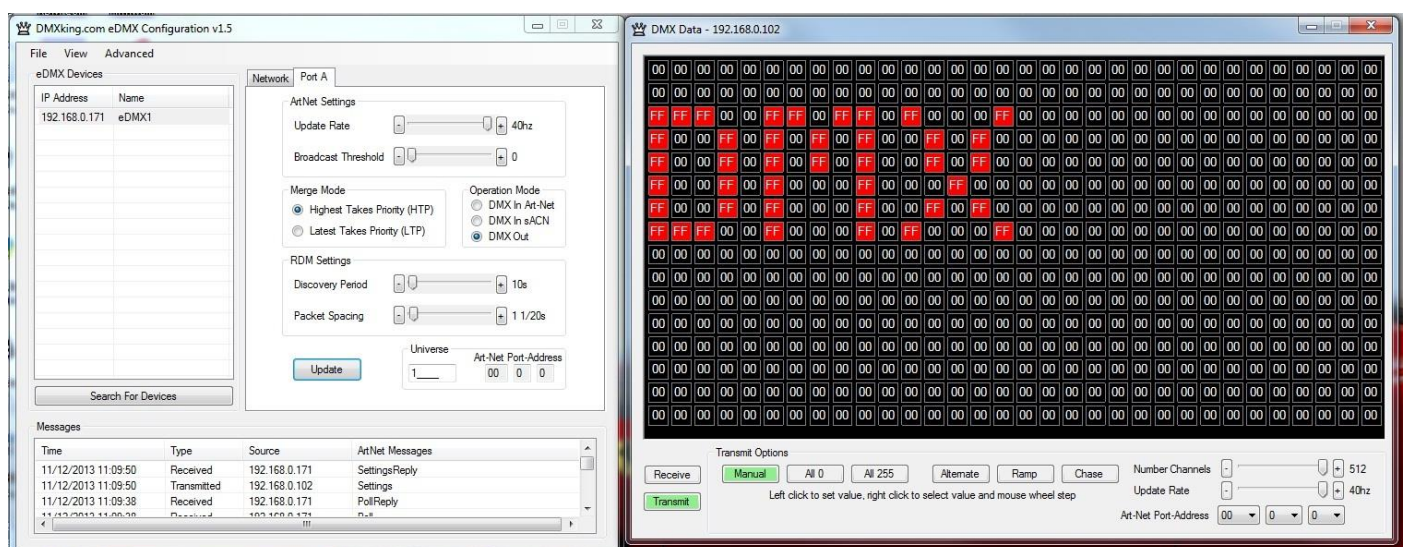
RECORDER TAB

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.

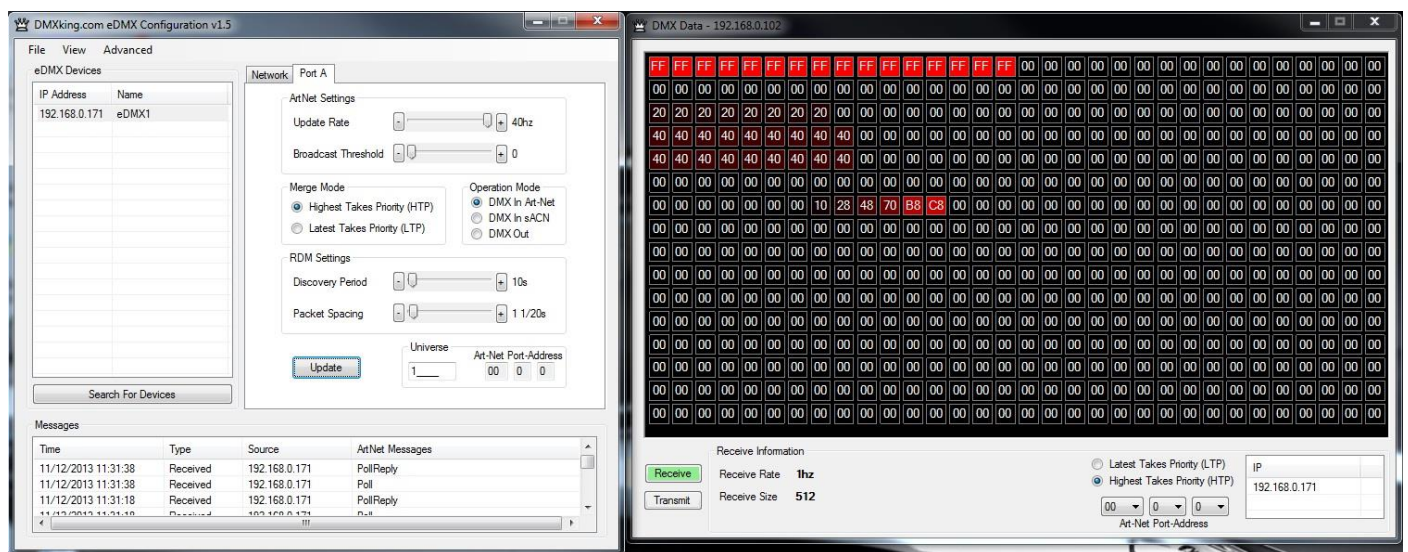
DMX DISPLAY FUNCTION

Select **View | DMX Display** for a simple DMX512 test utility. To generate an Art-Net output stream click Transmit then select one of the 6 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.



Changing to Receive mode will display the selected Art-Net universe number with merged streams if more than 1 is present. Note Art-Net II unicast is not supported meaning only Art-Net broadcast streams are displayed.



The DMX Display utility works with any manufacturers Art-Net hardware and can be useful for diagnostics and simple testing of DMX512 fixtures.

NODE REPORT

Node Report: #0001[11]DMX:40,40,40,40 SYNC:Async SHOW:000 REC:Idle

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

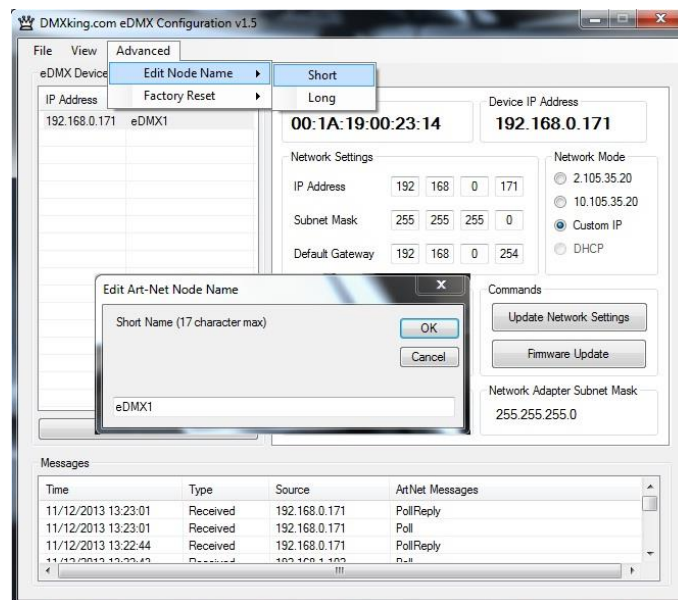
Above an eDMX4 PRO reports Port A,B,C,D at 40fps with no synchronization present (Async mode) and the recorder state Idle.

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 eDMX 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

Each DMX Port is fully independent which allows for configurations including setting multiple ports to the same universe. A commonly used configuration for eDMX4 PRO is 4x isolated DMX512 outputs of the same universe, thus turning the eDMX4 into a 1 universe Art-Net/sACN node + 4 port isolated splitter in one.

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 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 DMX Out port universe. Priority is 100. |
| DMX In sACN | Configure DMX In port universe to the same as DMX Out port 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. |
| DMX IN (1) | DMX IN (2) | Merge 2 external DMX512 sources. Priority is defined by the respective Discovery Period sliders (values of 0-200 valid). |

SACN / E1.31 PRIORITY

At any time if a higher priority sACN stream is received it will take over control a DMX Out channel regardless of other incoming streams or merging. When an sACN stream is stopped gracefully via a stream terminate message the eDMX port 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 (with explicit exclusion of anything involving potentially dangerous operations such as pyrotechnics) including moving lights, LED screens, fog machines and laser displays.

The DMXking.com eDMX4 unit is a 4 universe Art-Net/sACN device designed for use with computer based show control software or expansion of lighting console outputs. It replaces an entire lighting console allowing the user to perform sophisticated shows with little more than a laptop. There are many free and commercial software packages available and by selecting Art-Net as your DMX device compatibility is guaranteed.

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

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

7. TECHNICAL SPECIFICATIONS

- Dimensions: 250x44x60mm (WxHxD)
- Weight: 0.49kg
- DMX512 connector: 3 or 5 pin XLR Female per port
- Internal DMX512-A line biasing termination as per ANSI E1.20 RDM requirements.
- 1500V isolation on each port.
- Ethernet 10/100Mbps Auto MDI-X port.
- Power input: 802.3af Power over Ethernet. Maximum power budget 8W.
- Art-Net, Art-Net II, Art-Net 3, Art-Net 4 and sACN/E1.31 support.
- ANSI E1.20 RDM compliant with RDM over Art-Net.
- Universe Sync Art-Net, sACN and Madrix Post Sync.
- Both HTP and LTP merging of 2 Art-Net/sACN streams per port
- sACN Priority
- Internal merging capability with DMX In and DMX Out ports on same Universe.
- IPv4 Addressing
- IGMPv2 for multicast network management
- DMX512 Frame Rate: Adjustable per port
- DMX512 Port Protection: DMX512-A Protected as per E1.11-2008

8. 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

9. DECLARATIONS (FCC & CE)

FEDERAL COMMUNICATIONS COMMISSION (FCC) DECLARATION OF CONFORMITY

Responsible Party: JPK Systems Limited
PO Box 493
Pukekohe 2340
New Zealand

declares that the product eDMX4 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 eDMX4 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 harmonisation 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 October 2015

Position: Managing Director