

ODE MK3 - User Manual

Two-Universe bi-directional eDMX – DMX/RDM controller supporting Power over Ethernet (PoE).



The ODE MK3 is a solid-state RDM compatible DMX node designed for the highest level of portability, simplicity, and practicality. A perfect solution for converting from a multitude of Ethernet-based lighting protocols to physical DMX and vice versa without the need for adaptors.

With 2 Universes of bi-directional eDMX <-> DMX/RDM support female XLR5s and a PoE (Power over Ethernet) RJ45, ODE MK3 is simple and easy to connect physical DMX devices to your network infrastructure.

Connectors with EtherCon lockable feature in addition make the wiring secured with a peace of mind.

The configuration as well as the firmware updates of the ODE MK3 are managed through the localhost web interface to simplify commissioning from any computer on your network.


Features

- **Two-Universe bi-directional DMX / E1.20 RDM female XLR5s.**
- **One PoE (Power over Ethernet) RJ45 port supporting IEEE 802.3af (10/100 Mbps) and one optional DC 12-24v power input.**
- **Secured ‘EtherCon’ connectors.**
- **Support RDM over Art-Net & RDM (E1.20).**
- **Support for DMX -> Art-Net (Broadcast or Unicast) / DMX -> ESP (Broadcast or Unicast) / DMX -> sACN (Multicast or Unicast).**
- **HTP/LTP Merging support for up-to 2 DMX sources.**
- **Configurable DMX output refresh rate.**
- **Intuitive device configuration and updates through the inbuilt web interface.**
- **‘Current Port Buffer’ allows live DMX values to be viewed.**

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Safety


 **Ensure you are familiarized with all key information within this guide and other relevant ENTTEC documentation before specifying, installing, or operating an ENTTEC device. If you are in any doubt about system safety, or you plan to install ENTTEC device in a configuration that is not covered within this guide, contact ENTTEC or your ENTTEC supplier for assistance.**

ENTTEC's return to base warranty for this product does not cover damage caused by inappropriate use, application, or modification to the product.


Electrical safety

- 
- This product must be installed in accordance with applicable national and local electrical and construction codes by a person familiar with the construction and operation of the product and the hazards involved. Failure to comply with the following installation instructions may result in death or serious injury.
 - Do not exceed the ratings and limitations defined in the product datasheet or this document. Exceeding can cause damage to the device, risk of fire and electrical faults.
 - Ensure that no part of the installation is or can be connected to power until all connections and work is complete.
 - Before applying power to your installation, ensure your installation follows the guidance within this document. Including checking that all power distribution equipment and cables are in perfect condition and rated for the current requirements of all connected devices and factor in overhead as well as verifying that it is appropriately fused and voltage is compatible.
 - Remove power from your installation immediately if accessories power cables or connectors is in any way damaged, defective, shows signs of overheating or are wet.
 - Provide a means of locking out power to your installation for system servicing, cleaning and maintenance. Remove power from this product when it is not in use.
 - Ensure your installation is protected from short circuits and overcurrent. Loose wires around this device whilst in operation, this could result in short circuiting.
 - Do not over stretch cabling to the device's connectors and ensure that cabling does not exert force on the PCB.
 - Do not 'hot swap' or 'hot plug' power to the device or its accessories.
 - Do not connect any of this device's V- (GND) connectors to earth.
 - Do not connect this device to a dimmer pack or mains electricity.


System Planning and Specification

- 
- To contribute to an optimal operating temperature, where possible keep this device out of direct sunlight.
 - Any twisted pair, 120ohm, shielded EIA-485 cable is suitable to transmit DMX512 data. The DMX cable should be suitable for EIA-485 (RS-485) with one or more low capacitance twisted pairs, with overall braid and foil shielding. Conductors should be 24 AWG (7/0.2) or larger for mechanical strength and to minimize volt drop on long lines.
 - A maximum of 32 devices should be used on a DMX line before re-generating the signal using a DMX buffer/ repeater / splitter.
 - Always terminate DMX chains using a 120Ohm resistor to stop signal degradation or data bounce-back.
 - The maximum recommended DMX cable run is 300m (984ft). ENTTEC advises against running data cabling close to sources of electromagnetic interference (EMF) i.e., mains power cabling / air conditioning units.
 - This device has an IP20 rating and is not designed to be exposed to moisture or condensing humidity.
 - Ensure this device is operated within the specified ranges within its product datasheet.

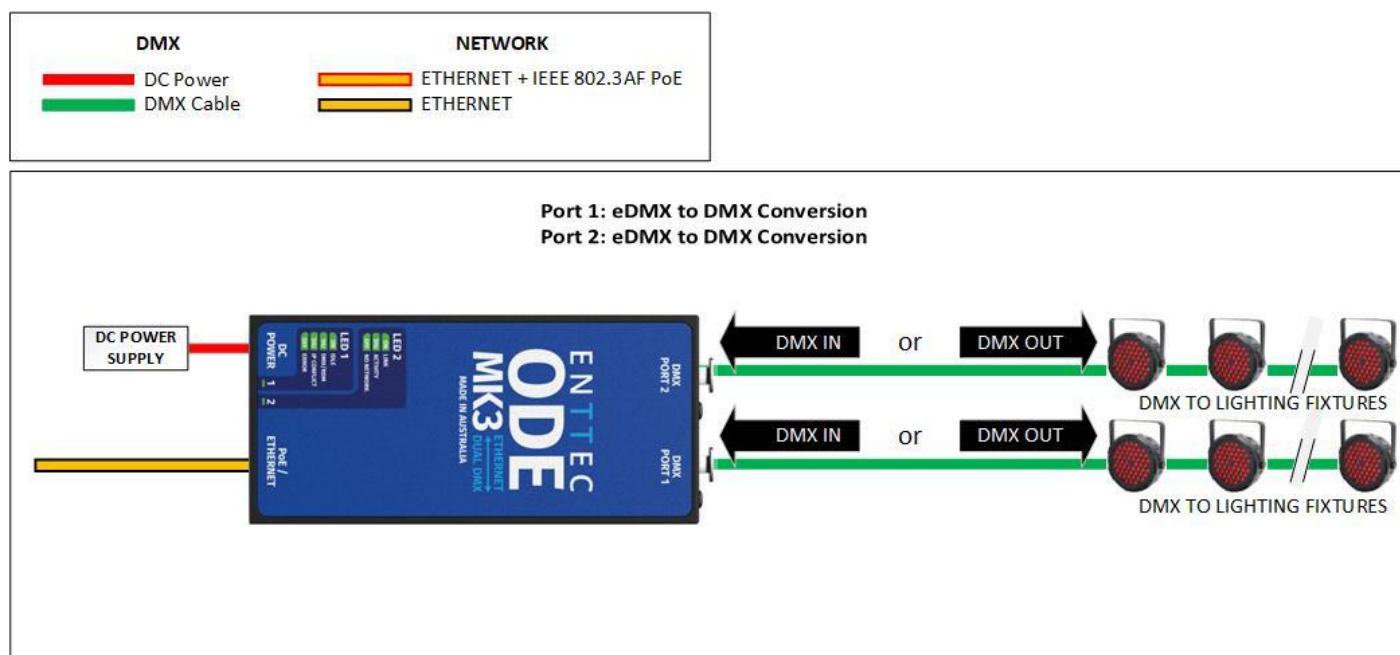
Protection from Injury During Installation

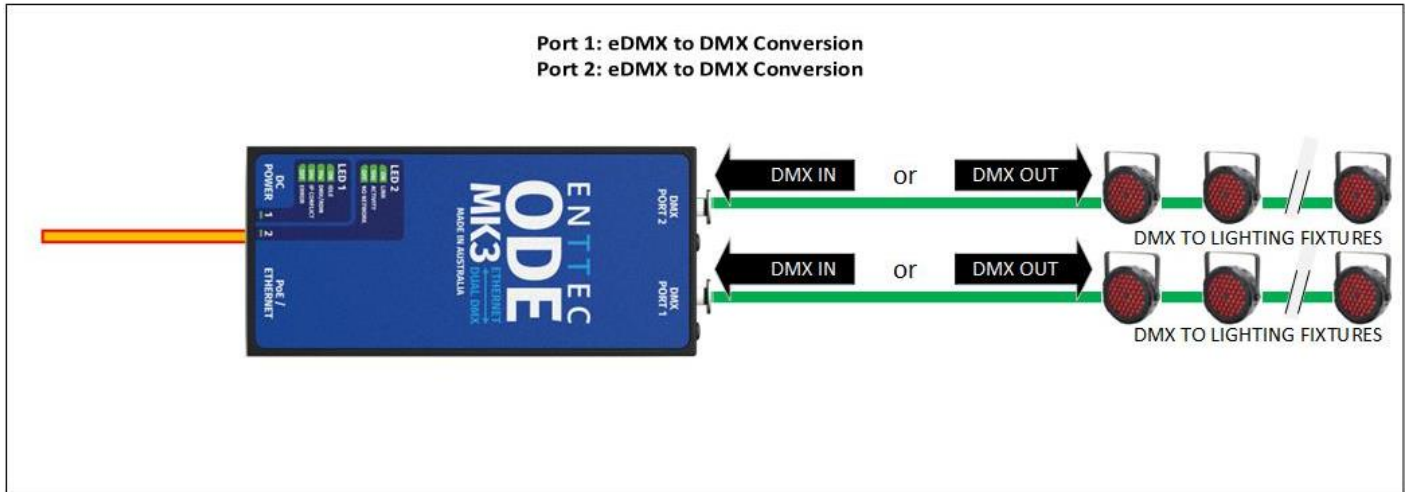
- 
 - Installation of this product must be performed by qualified personnel. If ever unsure always consult a professional.
 - Always work with a plan of the installation that respects all system limitations as defined within this guide and product datasheet.
 - Keep the ODE MK3 and its accessories in its protective packaging until final installation.
 - Note the serial number of each ODE MK3 and add it to your layout plan for future reference when servicing.
 - All network cabling should be terminated with an RJ45 connector in accordance with the T-568B standard.
 - Always use suitable personal protective equipment when installing ENTTEC products.
 - Once installation is completed, check that all hardware and components are securely in place and fastened to supporting structures if applicable.

Installation Safety Guidelines

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 - The device is convection cooled, ensure it receives sufficient airflow so heat can be dissipated.
 - Do not cover the device with insulating material of any kind.
 - Do not operate the device if the ambient temperature exceeds that stated in the device specifications.
 - Do not cover or enclose the device without a suitable and proven method of dissipating heat.
 - Do not install the device in damp or wet environments.
 - Do not modify the device hardware in any way.
 - Do not use the device if you see any signs of damage.
 - Do not handle the device in an energized state.
 - Do not crush or clamp the device during installation.
 - Do not sign off a system without ensuring all cabling to the device and accessories has been appropriately restrained, secured and is not under tension.

Wiring Diagrams





Hardware Features

- Electrically insulated ABS plastic housing
- 2* 5-Pin Female XLR for Bi-directional DMX Ports
- 1* RJ45 EtherCon Connection
- 1* 12–24V DC Jack
- 2* LED Indicators: Status and Link/Activity
- IEEE 802.32af PoE (active PoE)

DMX Connectors

The ODE MK3 features two 5-Pin Female XLR bi-directional DMX ports, which can be used either for DMX in or DMX out, depending on the settings set within the Web Interface.

5pin DMX OUT/ DMX IN:

- Pin 1: 0V (GND)
- Pin 2: Data -
- Pin 3: Data +
- Pin 4: NC
- Pin 5: NC



Any suitable 3 to 5pin DMX adaptor can be used to connect to 3pin DMX cables or fixtures. Please note the pinout, before connecting to any non-standard DMX connector.

LED Status Indicator

ODE MK3 comes with two LED indicators located between the DC Jack input and the RJ45 EtherCon Connector.

- **LED 1:** This is a Status indicator which blinks to indicate the following:

Frequency	Status
On	IDLE
1Hz	DMX / RDM
5 Hz	IP CONFLICT
Off	ERROR

- **LED 2:** This LED is a Link or Activity indicator which blinks to indicate the following:

Frequency	Status
On	Link
5 Hz	ACTIVITY
Off	NO NETWORK

- **LED 1 & 2 both blink at 1Hz:** When both LED blink at the same time, it indicates the ODE MK3 requires a firmware update or a reboot.

PoE (Power over Ethernet)

The ODE MK3 supports IEEE 802.3af Power over Ethernet. This allows the device to be powered via the RJ45 EtherCon Connection, reducing the number of cables and the ability to remotely deploy the ODE MK3 without the need for a local power source close to the device.

PoE can be introduced to the Ethernet cable, either through a network switch which outputs PoE under the IEEE 802.3af standard, or through an IEEE 802.3af PoE injector.

Note: DC power input has higher priority over PoE. In the event of DC power input disconnection, please expect approximately 1 minute down time before ODE MK3 reboots for PoE to take over.

Note: Passive PoE is not compatible with the ODE MK3.

Functional Features

Bi-directional eDMX Protocols and USITT DMX512-A Conversion

The ODE MK3's primary functionality is to convert between Ethernet-DMX protocols and USITT DMX512-A (DMX). The ODE MK3 can support eDMX protocols including Art-Net, sACN and ESP which can be received and converted to DMX with the HTP or LTP Merging options, or DMX converted to eDMX protocols with the options to Unicast or Broadcast/Multicast.

Art-Net <-> DMX (RDM Supported): Art-Net 1, 2, 3 & 4 are supported. Each port's configuration can be defined using the ODE MK3's web interface to define a universe in the range 0 to 32767.

RDM (ANSI E1.20) is supported whilst the ODE MK3's conversion 'Type' is set to Output (DMX Out) and the Protocol is set to Art-Net. When this is the case, a check box appears which will need to be ticked to enable RDM. This will convert Art-RDM to RDM (**ANSI E1.20**) to use the ODE MK3 as a gateway to discover, configure and monitor RDM capable devices on the DMX line connected to the port.

ENTTEC recommends disabling RDM if your fixtures do not require it. Some older fixtures that support the DMX 1990 Specification can sometimes behave erratically when RDM packets are on the DMX line.

The ODE MK3 does not support remote configuration through Art-Net.

sACN <-> DMX: sACN is supported. Each port's configuration can be defined using the ODE MK3's web interface to define a universe in the range 0 to 63999. sACN priority of the output can be defined (default priority: 100). The ODE MK3 supports a maximum of 1 multicast universe with sACN sync. (i.e. both universe outputs set to the same universe).

ESP <-> DMX: ESP is supported. Each port's configuration can be defined using the ODE MK3's web interface to define a universe in the range 0 to 255.

The additional flexibility that the ODE MK3 can provide, means that each of the two ports can be configured individually:

- Both outputs can be specified to use the same universe and protocol, i.e., both outputs can be set to output use universe 1.

- Each output is not required to be sequential i.e. port one can be set to universe 10, port two can be set to input universe 3.
- Protocol or data conversion direction doesn't have to be the same for each port.

Merging

Merging is available when the ODE MK3 'Type' is set to Output (DMX Out). Two different Ethernet-DMX sources (from different IP addresses) values can be merged if the source is the same protocol and universe.

If the ODE MK3 receives more sources than expected (Disabled – 1 source & HTP/LTP – 2 sources) the DMX Output will send this unexpected data, affecting the lighting fixtures, potentially causing flicker. The ODE MK3 will display a warning on the home page of the web interface and the status LED will blink at a high rate.

Whilst set to HTP or LTP merging, if either one of the 2 sources stop being received, the failed source is held in the merge buffer for 4 seconds. If the failed source returns the merge will continue, otherwise it will be discarded.

Merging options include:

- **Disabled:** No Merging. Only one source should be sending to the DMX output.
- **HTP Merge (by default):** Highest Takes Precedence. Channels are compared one to one and the highest value is set on the output.
- **LTP Merge:** Latest Takes Precedence. The latest source received is used as the output.

Out of the Box

The ODE MK3 will be set to a DHCP IP address as default. If the DHCP server is slow to respond, or your network does not have a DHCP server, the ODE MK3 will fall back to the Static IP address which will be 192.168.0.10 as default.

The ODE MK3 will also be set as DMX Input as default, listening to DMX512-A and converting to Art-Net-4 packets that are sent out on Universe 0 to IP address 192.168.0.11.

Networking

The ODE MK3 can either be configured to be a DHCP or Static IP address.

DHCP: On power up and with DHCP enabled, if the ODE MK3 is on a network with a device/router with a DHCP server, the ODE MK3 will request an IP address from the server. If the DHCP server is slow to respond, or your network does not have a DHCP server, the ODE MK3 will fall back to the Static IP address. If a DHCP address is provided, this can be used to communicate with the ODE MK3.

Static IP: By default (out of the box) the Static IP address will be 192.168.0.10. If the ODE MK3 has DHCP disabled or if the ODE MK3 falls back to the Static IP address after being unable to find a DHCP server, the Static IP address given to the device will become the IP address to communicate with the ODE MK3. The fall-back address will change from the default once it's modified in the web interface.



Note: When configuring multiple ODE MK3's on a Static network; to avoid IP conflicts, ENTTEC recommends connecting one device at a time to the network and configuring an IP.

- If using DHCP as your IP addressing method, ENTTEC recommends the use of the sACN protocol, or Art-Net Broadcast. This will ensure that your ODE MK3 continues to receive data if the DHCP server changes it's IP address.
- ENTTEC does not recommend unicasting data to a device with its IP address set through DHCP server on long term installations.

Web Interface

Configuring the ODE MK3 is done through a web interface which can be brought up on any modern web browser.

- **Note:** A Chromium based browser (i.e. Google Chrome) is recommended for accessing the ODE MK3 web interface.
- **Note:** As the ODE MK3 is hosting a web server on the local network and does not feature an SSL Certificate (used to secure online content), the web browser will display the 'Not secure' warning, this is to be expected.

Identified IP address: If you are aware of the ODE MK3 IP address (either DHCP or Static), then the address can be typed directly into the web browsers URL field.

Unidentified IP address: If you are not aware of the ODE MK3's IP address (either DHCP or Static) the following discovery methods can be used on a local network to discover devices:

- An IP scanning software application (i.e. Angry IP Scanner) can be run on the local network to return a list of active devices on a local network.
- Devices can be discovered using Art Poll (i.e. DMX Workshop if set to use Art-Net).
- The device Default IP address 192.168.0.10 is printed on the physical label on the rear of the product.
- ENTTEC EMU software (available for Windows and MacOS), which will Discover ENTTEC devices on the Local Area Network, will display their IP addresses and open to the Web Interface before opting to configure the device.



Note: The eDMX protocols, the controller and the device using to configure the ODE MK3 must be on the same Local Area Network (LAN) and be within the same IP address range as the ODE MK3. For example, if your ODE MK3 is on Static IP address 192.168.0.10 (Default), then your computer should be set to something such as 192.168.0.20. It is also recommended that all devices Subnet Mask are the same across your network.

Home

The landing page for the ODE MK3 web interface is the Home tab. This tab is designed to give you a read-only device overview. This will display:

System Information:

- Node Name
- Firmware Version

Current Network Settings:

- DHCP Status
- IP Address
- NetMask
- Mac Address
- Gateway Address
- sACN CID
- Link Speed

Current Port Settings:

- Port
- Type
- Protocol
- Universe

The screenshot shows the ENTTEC web interface with the following sections:

- System Information:**
 - Node Name: ODE MK3 2 port
 - Firmware Version: ENTTEC ODE MK3 Firmware V1.0
- Current Network Settings:**
 - DHCP: Enabled
 - IP Address: 10.10.3.51
 - NetMask: 255.255.255.0
 - MAC Address: d0 9f e9 90 60 00
 - Gateway Address: 10.10.3.254
 - sACN CID: 161DSACB-5073-17BE-85A1-6C08C3316BEE
 - Link Speed: 100 Mbps
- Current Port Settings:**

Port	Type	Protocol	Universe	Send Rate	Merging	Send To
Port1	Input (DMX IN)	Art-Net	0	40	Disabled	192.168.0.11
Port2	Input (DMX IN)	Art-Net	0	40	Disabled	192.168.0.11
- Current DMX buffer:**
 - Port 1: [Click to see current DMX Port1 buffer](#)
 - Port 2: [Click to see current DMX Port2 buffer](#)

- Send Rate
- Merging
- Send to Destination

Current DMX Buffer: The Current DMX buffer displays a snapshot of all current DMX values when refreshed manually.

Settings

The ODE MK3 settings can be configured within the Settings tab. Changes will only take affect after being saved; any unsaved changes will be discarded.

Node Name: The name of ODE MK3 will be discoverable with in Poll replies.

DHCP: Enabled by default. When enabled, the DHCP server on the network is expected to automatically provide the IP address to the ODE MK3. If no DHCP router/server is present or DHCP is disabled, the ODE MK3 will fall back to the static IP address.

IP Address / NetMask / Gateway: These are used if DHCP is disabled or unavailable. These options set the Static IP address. These settings should be set to be compatible with other devices on the network.

sACN CID: The ODE MK3's unique sACN Component Identifier (CID) is displayed here and will be use in all sACN communication.

Control4 Support: Pressing this button will send a SDDP (Simple Device Discovery Protocol) packet to allow faster configuration in discovery in Control4's Composer software.

Type: Choose from the following options:

- Disabled - will not process any DMX (input or output).
- Input (DMX IN) – Will convert DMX from the 5-pin XLR to an Ethernet-DMX protocols.
- Output (DMX Out) – Will convert Ethernet-DMX protocols to DMX on the 5-pin XLR.

RDM: RDM (ANSI E1.20) can be Enabled using the tick box. This is only available when the Type is set to 'Output' and the Protocol is 'Art-Net'. More information can be found in the Functional Features section of this document.

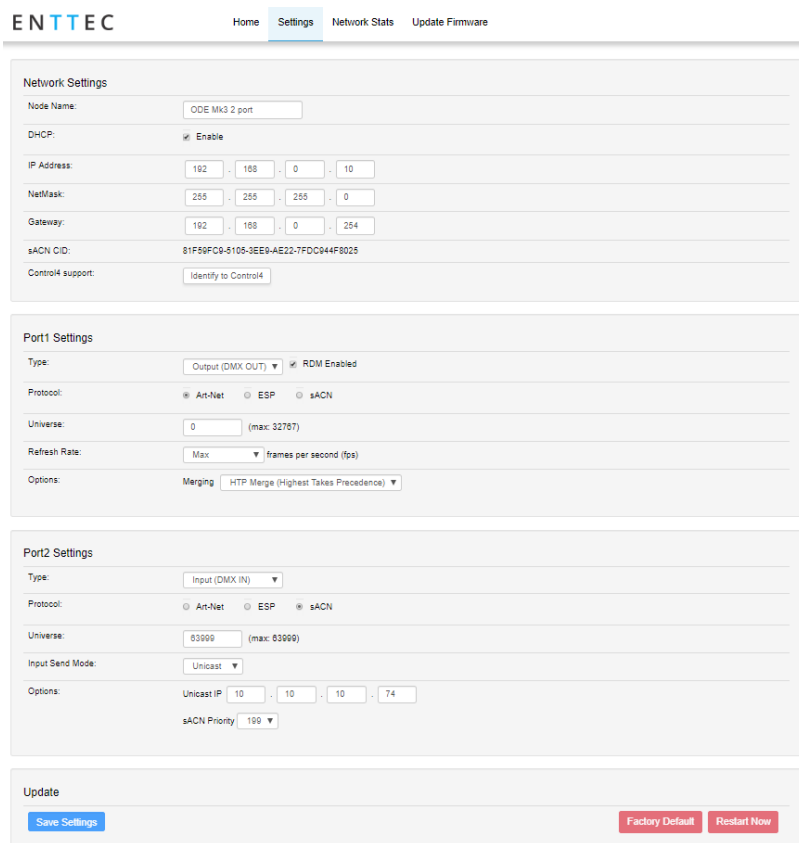
Protocol: Choose between Art-Net, sACN and ESP as the Protocol.

Universe: Set the **Ethernet-DMX protocol's input Universe.**

Refresh Rate: The rate at which the ODE MK3 will output the data from its DMX port (40 Frames per second is default). It will repeat the last received frame to comply with DMX standard.

Options: additional configuration is available depending on port type and protocol.

- **Input Broadcast/Unicast:** Choose either broadcasting or a specified unicast IP address. Broadcast address is based on the subnet mask shown. Unicast allows you to define a specific single IP address.



Visit the ENTTEC website for the latest version.

- Input sACN Priority:** sACN Priorities range from 1 to 200, where 200 has the highest priority. If you have two streams on the same Universe, but one has the default priority of 100 and the other has a priority of 150, the second stream will override the first. If they both have the same priority, the streams will merge on an HTP (highest-takes-precedence) basis.
- Output Merging:** When enabled, this can allow the merging for two DMX sources from different IP address whilst sending on the same Universe in either a LTP (Latest Takes Precedence) or HTP (Highest Takes Precedence) merge. More information can be found in the Functional Features section of this document.

Save settings: All changes must be saved to take effect. The ODE MK3 takes up-to 10 seconds to save.

Factory Default: Factory resetting the ODE MK3 results in the following:

- Resets the device name to defaults
- Enables DHCP
- Static IP 192.168.0.10 / Netmask 255.255.255.0
- Output protocol is set to Art-Net
- Merging Unicast address 192.168.0.11
- Port 1 Universe 0
- Port 2 Universe 0
- RDM disabled

Restart Now: Please allow up-to 10 seconds for the device to reboot. When the web interface page refreshes the ODE MK3 is ready.

Network Stats

The Network Stats tab is designed to provide an overview of the network data. This is broken down into Ethernet-DMX protocols statistics which can be located within the tabs.

The Summary provides details regarding total packets sent /received, as well as Poll packets, last IP address and Port.

Art-Net Statistics also provide a breakdown of Art-Net DMX packets sent and received. As well as a breakdown of RDM over Art-Net packets including packet sent and received, Subdevice and TOD Control/Request packets.

Summary	
Total Packets Received	1
Poll Packets Received	1
Last IP	10.10.10.78
Last Port	8484

Art-Net DMX	
DMX Data Packets Received	1
DMX Sync Packets Received	0
DMX Data Packets Sent	2

RDM over Art-Net	
RDM Packets Received	0
RDM Packets Sent	0
RDM TOD Control Packets Received	0
RDM TOD Request Packets Received	0
RDM TOD Data Packets Sent	1
RDM Packets Dropped	0

Update Firmware

On selecting the Update Firmware tab, the ODE MK3 normal operation will stop, and the web interface boot into the Update Firmware mode takes up-to 10 seconds.

This mode will display basic information regarding the device including current Firmware Version, Mac Address and IP address information.

The latest firmware can be downloaded from www.enttec.com. Use the Browse button to access the latest ODE MK3 firmware file which has a .bin extension in your local computer.

Next click on the Update Firmware button to begin

Current System Information	
Boot Version:	ENTTEC ODE Mk3 Boot V1.0
Firmware Version:	ENTTEC ODE Mk3 Firmware V1.0
Mac Address:	d8:9f:d0:00:00:00
Link Speed:	100 Mbps



Current Network Settings	
DHCP:	Enabled
IP Address:	10.10.3.81
Gateway IP Address:	10.10.3.254

Firmware Update	
Upload New Firmware:	<input type="button" value="Browse"/> <input type="button" value="Update Firmware"/>
Update progress:	Please do not interrupt while the firmware is being updated. Unit will restart once firmware update is complete.

updating.

After the update has completed, the web interface will load the Home tab, where you can check the update was successful under Firmware Version. Once the Home tab has loaded, the ODE MK3 will resume operation.

Servicing, Inspection & Maintenance

-  ■ The device has no user serviceable parts. If your installation has become damaged, parts should be replaced.
-  ■ Power down the device and ensure a method is in place to stop the system from becoming energized during servicing, inspection & maintenance.

Key areas to examine during inspection:




- Ensure all connectors are mated securely and show no sign of damage or corrosion.
- Ensure all cabling has not obtained physical damage or been crushed.
- Check for dust or dirt build up on the device and schedule cleaning if necessary.
- Dirt or dust buildup can limit the ability for a device to dissipate heat and can lead to damage.

The replacement device should be installed in accordance with all steps within the installation guide. To order replacement devices or accessories contact your reseller or message ENTTEC directly.

Cleaning

Dust and dirt build up can limit the ability for the device to dissipate heat resulting in damage. It's important that the device is cleaned in a schedule fit for the environment it is installed within to ensure maximum product longevity.

Cleaning schedules will vary greatly depending on the operating environment. Generally, the more extreme the environment, the shorter the interval between cleaning.

-  ■ Before cleaning, power down your system and ensure a method is in place to stop the system from becoming energized until cleaning is complete.
-  ■ Do not use abrasive, corrosive, or solvent-based cleaning products on an device.
-  ■ Do not spray device or accessories. The device is an IP20 product.

To clean an ENTTEC device, use low-pressure compressed air to remove dust, dirt and loose particles. If deemed necessary, wipe the device with a damp microfiber cloth.

A selection of environmental factors that may increase the need for frequent cleaning include:

- Use of stage fog, smoke or atmospheric devices.
- High airflow rates (i.e., in close proximity to air conditioning vents).
- High pollution levels or cigarette smoke.
- Airborne dust (from building work, the natural environment or pyrotechnic effects).

If any of these factors are present, inspect all elements of the system soon after installation to see whether cleaning is necessary, then check again at frequent intervals. This procedure will allow you to determine a reliable cleaning schedule for your installation.

Package Contents

- ODE MK3
- Ethernet Cable
- Power supply with AU/EU/UK/US adapters

Ordering Information

For further support and to browse ENTTEC's range of products visit the [ENTTEC website](#).

Item	Part No.
ODE MK3	70407

enttec.com

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Due to constant innovation, information within this document is subject to change.