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1 Safety

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

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

1.1 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 and verify 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.
- Label any Cat5/6 DMX connector and DO NOT connect to non-DMX port (eg Ethernet Switch). Connecting unlike systems could result in damage to DX10 and equipment.

1.2 System Planning and Specification

- To contribute to an optimal operating temperature, where possible keep this device out of direct sunlight.
- The maximum recommended cable distance between the DX10's output and DMX fixture is 300m (1000ft). LED CTRL advises against running 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.

1.3 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 product and its accessories in its protective packaging until final installation.
- Note the serial number of each product 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 LED CTRL products.
- Once installation is completed, check that all hardware and components are securely in place and fastened to supporting structured if applicable

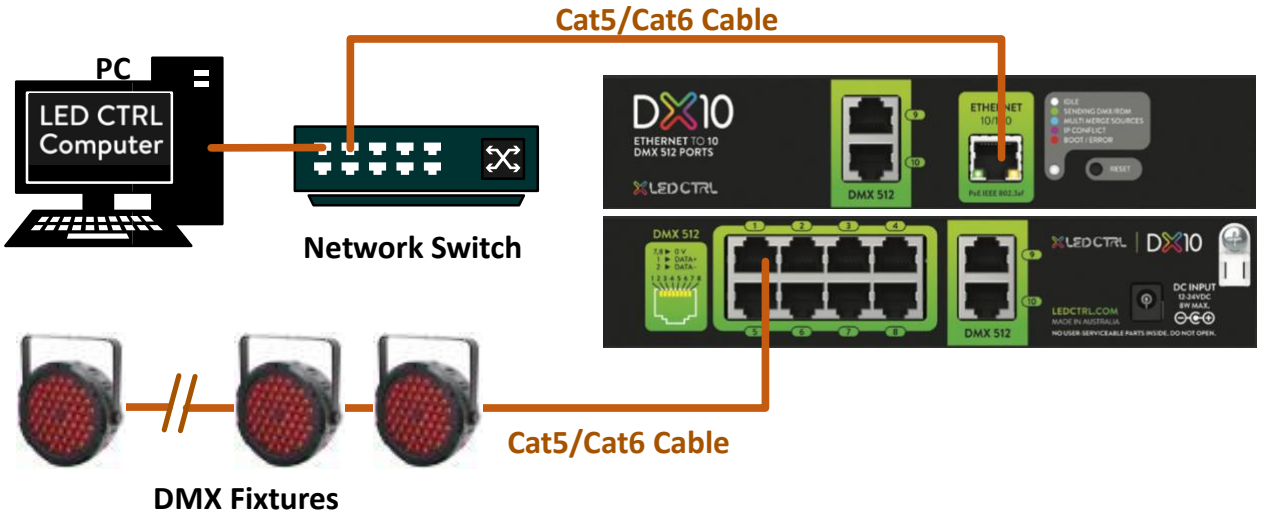
1.4 Installation Safety Guidelines

- 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.

2 Introduction

This is the user manual for the LED CTRL DX10 DMX/RDM controller. The DX10 is a compact 10 port unit which converts sACN and ArtNet from lighting control systems such as LED CTRL to the DMX512 protocol.

3 Wiring Diagram



4 Functional Features

- 10 Universes Ethernet-DMX to DMX/RDM Node.
- Supports Art-Net, sACN & ESP Ethernet-DMX protocols.
- Allows individual port settings including disable certain output ports, input protocols, Universe, Refresh Rate and Output Merge.
- Supports DHCP or Static IP address.
- Intuitive device configuration and updates through the local host web interface.

4.1 RDM

RDM ANSI E1.20 is supported. This will convert Art-RDM to RDM (ANSI E1.20) to use the DX10 as a gateway to discover, configure and monitor RDM capable devices on the DMX line connected to the port.

4.2 Merging

Two different Ethernet-DMX sources (from different IP addresses) values can be merged if the sources are the same protocol and universe.

If the DX10 receives more sources than expected (Disabled – 1 source & HTP/LTP – 2 sources) The unexpected source will be ignored until it becomes available for the next source. This helps protect from random data on your network

sending your show into chaos. The DX10 will display an error at Merge Status on the home page of the web interface and the status LED will light up cyan.

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:

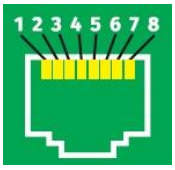
- None: No Merging. Only one source should be sending to the DMX output.
- HTP (Highest Takes Precedence): Each changing data per channel will be compared and set to the one with the highest value.
- LTP (Latest Takes precedence): The source with the latest changing data per universe takes precedence.

5 Hardware Features

- Total 12 x RJ45 ports for DMX/RDM output.
  - 10 x Rear RJ45 ports
  - 2 x Forward-Facing RJ45 service ports - duplicating Port 9&10 outputs.
- Link & Activity LED indicator built-in RJ45 port for Ethernet input.
- Forward-facing LED status indicator.
- Mounting accessories included allowing surface/din mount or rack mount in half or full width rack spaces.

5.1 DMX Output RJ45 Connectors

- Pin 1: Data +
- Pin 2: Data –
- Pin 7/8: Ground



5.2 Forward-Facing Service Ports

Featuring two forward-facing service ports which electronically duplicate the rear Port 9 and 10, the DX10 provides convenient access for troubleshooting without reach to the back of the rack. The DMX rules and maximums apply to the front and rear ports combined including output and wiring limitations.

Example: As per DMX512 standard, the total load permitted on a DMX512 data link is 32 unit loads. Users can connect to any combination of up to 32 fixtures to port 9 or Port 10. In other words, 16 fixtures at the front & 16 fixtures at the back or 0 at the front & 32 at the back. In the same way to the maximum recommended cable distance between the DX10's output and DMX fixture which is 300m combined for both ports.

5.3 LED Status Indicator

The LED status indicator can be used to determine DX10's current state. Each state is as follows:

LED Color	DX10 Status
White (static)	Idle
Green	Sending DMX/RDM
Cyan	Multiple Merge Sources
Purple	IP Conflict
Red	Device in boot / Error

5.4 PoE (Power over Ethernet)

The DX10 supports IEEE 802.3af Power over Ethernet. This allows the device to be powered via the RJ45 Ethernet Connection, reducing the number of cables and the ability to remotely deploy the DX10 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 DX10 reboots for PoE to take over.

Note: Passive PoE is not compatible with the DX10.

6 Out of the Box

The DX10 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, DX10 will fall back to IP address 192.168.0.10. By Default, DX10 port settings are as below:

- Type: DMX OUT (RDM)
- Protocol: Art-Net
- Universe to Port 1=0, Port 2=1, Port 3=2, Port 4=3, Port 5=4, Port 6=5, Port 7=6, Port 8=7, Port 9=8, Port 10=9
- Refresh Rate: 40fps
- Output Merging: None

7 Networking

DX10 can either be configured to be DHCP or Static IP address.

DHCP: On power up and with DHCP enabled, if DX10 is on a network with a device/router with a DHCP server, DX10 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, DX10 will fall back to the IP address 192.168.0.10 and netmask 255.255.255.0. If a DHCP address is provided, this can be used to communicate with DX10.

Static IP: By default (out of the box) the Static IP address will be 192.168.0.10. If the DX10 has DHCP disabled, the Static IP address given to the device will become the IP address to communicate with the DX10. The Static IP address

will change from the default once it's modified in the web interface. Please note down the Static IP address after setting.

Note: When configuring multiple DX10's on a Static network; to avoid IP conflicts, LED CTRL recommends connecting one device at a time to the network and configuring an IP.

- LED CTRL recommends using the DX10 with a static IP address with sACN or ArtNet Unicast. This ensures most reliable connection and minimised unnecessary network trafiic.
- If using DHCP as your IP addressing method, LED CTRL recommends the use of the sACN Multicast, or ArtNet Broadcast. This will ensure that DX10 continues to receive data if the DHCP server changes it's IP address.
- LED CTRL does not recommend unicasting data to a device with its IP address set through DHCP server on long term installations.

8 Web Interface

Configuring the DX10 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 DX10's web interface.

Note: As the DX10 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 DX10's 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 DX10's IP address (either DHCP or Static) the following discovery methods can be used on a local network to discover devices:

- Use LED CTRL File-> Settings-> Artnet settings to detect DX10's on the same network.
- 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 (if not able to be detected by LED CTRL).
- 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 will be printed on the physical label on the rear of the product.

Note: The eDMX protocols, the controller and the device using to configure DX10 must be on the same Local Area Network (LAN) and be within the same IP address range as DX10. For example, if your DX10 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.

8.1 Top Menu

The Top Menu allows all DX10 web pages to be accessed. Menu option is highlighted green to indicate which page the user is on.

8.2 Home

Home tab displays the following information:

System information:

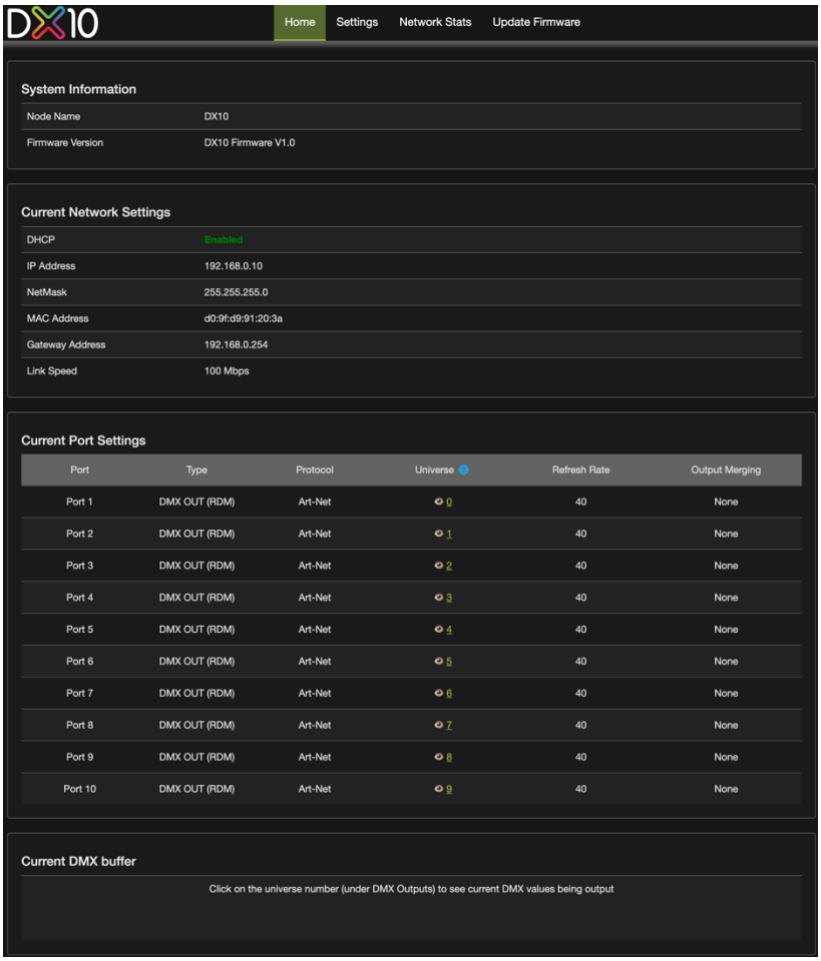
- Node Name
- Firmware Version

Current Network Settings:

- DHCP: Enabled (Green) / Disabled (Red)
- IP address
- Netmask
- MAC Address
- Gateway address
- Link Speed

Current Port Settings (DMX Outputs)

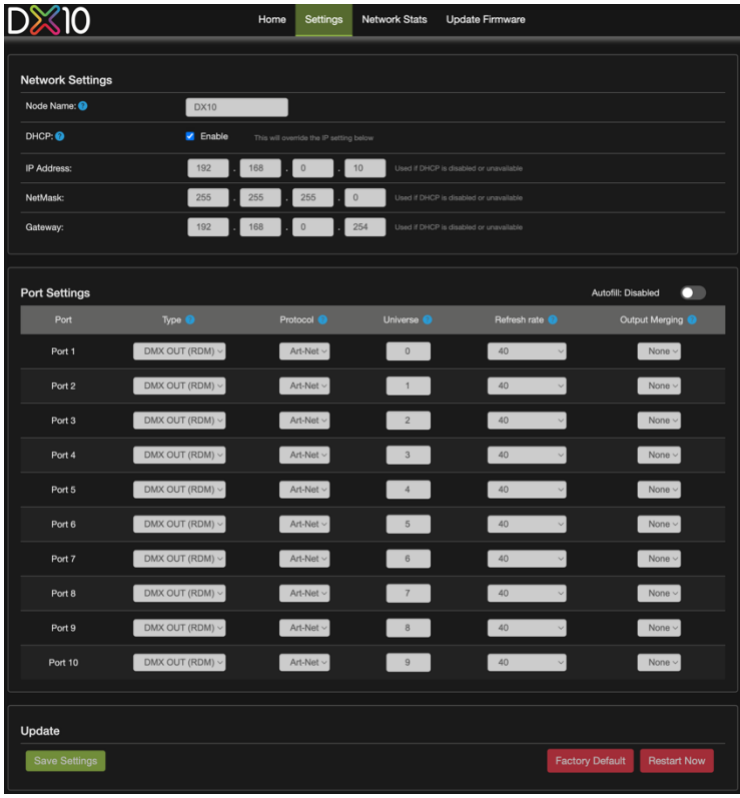
- Port: the port number on the device.
- Type: Disable/DMX OUT/DMX OUT (RDM)
- Universe: universe number/disabled
- Protocol: Art-Net/sACN/ESP
- Refresh Rate
- Merge Status: None/Broadcast/Unicast



Current DMX Buffer:

- Current DMX values will be displayed by clicking on the universe number.

8.3 Settings



The DX10 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 the DX10 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 DX10. When DHCP enabled but there is no DHCP server or it's slow to respond, the DX10 will fall back to 192.168.0.10.

IP Address / NetMask / Gateway: These can be set for use when DHCP is disabled.

Port Settings: This is where users can set individual port configuration or enable the 'Autofill' function to manage group port settings. Any port settings after the one changed will autofill to match unless it has already been changed. Autofill isn't applied to DMX universes.

Port: List of ports referring to the port number on the device.

Type: Disabled, DMX OUT, DMX OUT (RDM).

Protocol: Set individual input Ethernet-DMX protocol for the port: Art-Net, ESP, sACN.

Universe: 0-32767 (Art-Net), 0-255 (ESP), 1-63999 (SACN)

Refresh Rate: The rate at which the DX10 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.

Output Merging: None/HTP/LTP. 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 DX10 takes up-to 10 seconds to save.

Factory Default: Press this command to reset the DX10 to Factory Defaults. Please refer to 'Reset to Factory Defaults' section of this document for more details.

Restart Now: Please allow few seconds for the device to reboot. When the web interface page refreshes the DX10 is ready.

8.4 Network Stats

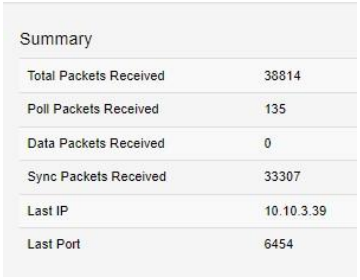
The Network page shows statistics for the DMX protocol enabled.

Listed below is the information provided in each tab:

Art-Net Statistics

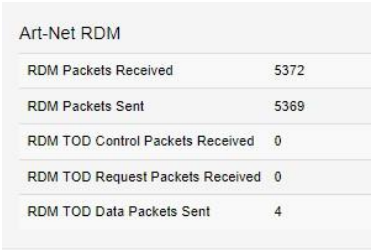
Summary

- Total packets received
- Poll Packets received
- Data Packets Received
- Sync Packets Received
- Last IP
- Last Port



Art-Net RDM

- RDM Packets Received
- RDM Packets Sent
- RDM TOD Control Packets Received
- RDM TOD Request Packets Received
- RDM TOD Data Packets Sent



ESP Statistics

Summary

- Total Packets Received
- Poll Packets Received
- Data Packets Received
- Last IP
- Last Port

sACN Statistics

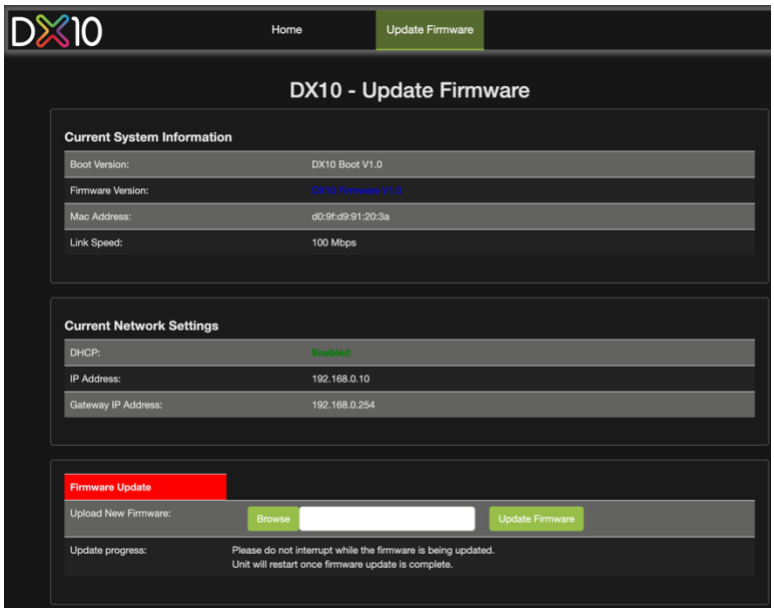
Summary

- Total Packets Received
- Data Packets Received
- Sync Packets Received
- Last IP
- Last Port

8.5 Update Firmware

When selecting the Update Firmware tab, the DX10 will stop outputting and the web interface boots into the Update Firmware mode. It may take a while depending on the network setting. An error message is expected as the webpage is temporary unavailable in boot mode.

This mode will display basic information regarding the device including current system information and network settings.



The latest firmware can be downloaded from www.LEDCTRL.com. Use the Browse button to select a DX10 firmware from your computer. DX10 firmware files have a .bin extension.

Next click on the Update Firmware button to begin updating.

Once the file has been downloaded, the DX10 will begin installing the update. While doing that the Home page will be greyed out and a message indicating that the update is in progress will be displayed. The site will become accessible again once the update has finished installing.

9 Reset to Factory Defaults

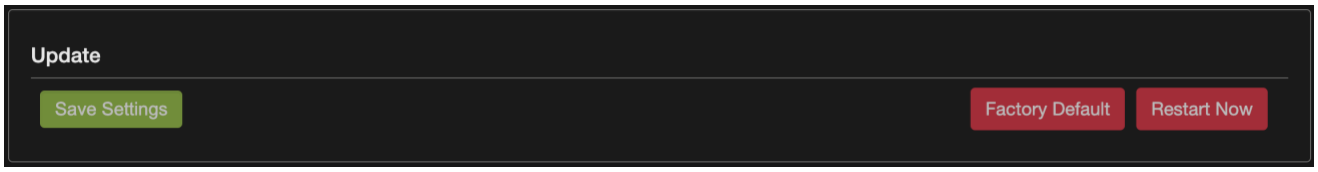
Factory resetting the product results in the following:

- Device name: DX10
- DHCP Enabled
- Static IP address: 192.168.0.10
- Gateway IP: 192.168.0.254
- Netmask: 255.255.255.0
- Port setting (Autofill disabled):
- Type: DMX OUT (RDM)
- Protocol: Art-Net.

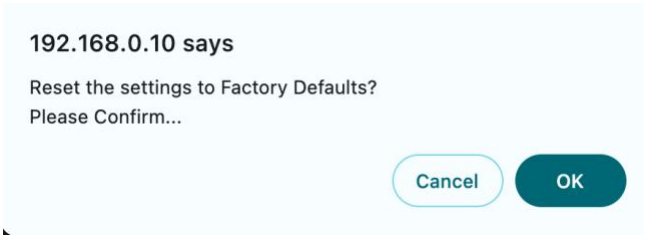
- Reset Universe to Port 1=0, Port 2=1, Port 3=2, Port 4=3, Port 5=4, Port 6=5, Port 7=6, Port 8=7, Port 9=8, Port 10=9
- Refresh Rate: 40fps
- Output Merging: None

10 Resetting via Web Interface

The Factory Defaults command can be found under the Settings tab.



Once the command is pressed, a pop-up will appear as shown in the image below:



10.1 Resetting by Reset Button

The reset button restores the network configuration of DX10 to factory defaults. To reset to factory defaults, the following procedure must be performed:

- Power off the unit
- Press and hold the Reset button.
- While holding the Reset button, power up the unit, and keep holding the button for 3 seconds.
- Release the Reset button once the status led starts blinking red.
- Power cycle the unit

11 Frequently Asked Question

11.1 I'm unable to connect to the DX10 web interface.

Ensure that the DX10 and your computer are on the same subnet. To troubleshoot:

- Connect the DX10 directly to your computer using a Cat5 cable and power it on.
- Give your computer a Static IP address (e.g.: 192.168.0.20).
- Change computer Netmask to (255.255.255.0).
- Attempt to connect to 192.168.0.10 via a web browser.
- Use Angry IP scanner or similar to identify the IP of the device
- Once you find the DX10, you will be able to open the device webpage and configure it.

Factory Reset the device using the reset button if the above steps do not resolve the issue.

The DX10's factory default resets the DX10 to static IP address 192.168.0.10 and Netmask 255.255.255.0 with DHCP enabled.

When the DX10 has DHCP enabled but DHCP server is unavailable (e.g. the device is connected to a computer without DHCP server), the IP address will fall back to 192.168.0.10 with netmask 255.255.255.0.

12 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:

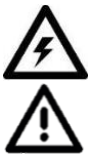
- Ensure all connectors are mated securely and show no sign of damage or corrosion.
- Ensure all cabling has not obtained physical damage or been crushed.
- Check for dust or dirt build up on the device and schedule cleaning if necessary.
- Dirt or dust buildup can limit the ability for a device to dissipate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

To order replacement devices or accessories contact your reseller or message LED CTRL directly.

12.1 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 cleanings.



- **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 a device.**
- **Do not spray device or accessories. The device is an IP20 product**

To clean a LED CTRL 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.

13 Package Content

- DX10
- 1 x 12V PSU adaptor with international plugs
- Rack mounting bracket x 2pcs + Screws x6pcs
- Surface/Din mounting bracket x 2pcs + Screws x 4pcs
- Din Rail Clip x 2pcs & Screws x 4pcs