



The Universes tab of Setup is a single place for configuring each separate method (“protocol”) of sending lighting data out of the console to your lighting rig.

Fixtures can be patched across 64 “Desk Universes”. The total number of channels used across the 64 universes cannot exceed the total number of channels your console is licenced for.

At the top of the “Universes” tab are panels for the global settings of each protocol – in most situations, these are all you will need. Below these are a panel for each of the 64 “Desk Universes”, providing a method of fine tuning your universe routing (for example, you could send the data for fixtures patch to “Desk Universe 5” to sACN Universe 5, Art-Net Universe 4 and DMX Output 1).

Find out more about the available protocols and the Desk Universes in the Universes tab...

- [DMX](#)
- [streamingACN](#)
- [Art-Net 4](#)
- [CITP \(Capture\)](#)
- [Remote Device Management \(RDM\)](#)
- [Desk Universes](#)

Remote Device Management

Remote Device Management is a protocol that expands the capabilities of DMX, providing a method for two-way communication between the console and the other devices in your rig, such as fixtures.

ZerOS' implementation of RDM is called "RigSync" which allows ZerOS to manage the rig – ensuring the console and lighting rig are synchronised, not just at the point of "patching" but continuously through the performance. New fixtures are automatically added, problems such as collisions in DMX addresses are automatically fixed, and settings such as modes and alignments are automatically kept in sync between the console and the rig. If a new fixture is added, ZerOS automatically assigns it settings, adjusting other fixtures if necessary to ensure the rig works. Patched fixtures which don't support remote management are avoided rather than ignored.

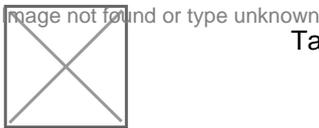
ZerOS will patch RDM fixtures with dimmers first, then LED fixtures, and then moving lights, in the order of their current DMX address.

When RigSync discovers RDM fixtures, "RigSync is processing x devices" will be shown at the top of the Output window, whilst ZerOS processes the fixtures and patches them. If any of the devices patched by RigSync go offline, whether that be because they lose DMX connection or power, an error notification will be shown in the Output window. You will be able to view the errors, or dismiss them. A red cross will be displayed next to the fixture numbers of fixtures that are currently offline.



Take a look at this video to see RDM in action.

<https://youtu.be/9d2XQKankbo>



Take a look at this video to see RigSync in action.

<https://youtu.be/1Rbfj0nvgYA>



RigSync can be enabled or disabled within the RDM panel of the "Universes" tab within Setup. On FLX, RigSync is disabled by default. On FLX S, RigSync is enabled by default on DMX port 1.

Discover All Fixtures

The **Discover all fixtures** button discovers and patches all possible fixtures at the point it's pressed. Although this usually happens automatically when RigSync is enabled, there are situations when it won't. For example, if you delete a fixture that was discovered by RigSync, that fixture won't be rediscovered and re-patched unless you press **Discover all fixtures**.

Revert Rig

The [Revert rig back](#) button reverts all fixtures to the settings they had when they were first discovered by RigSync. For example, if the whole rig was DMX Address 1, RigSync will remember those settings (and store them in the showfile) before automatically changing the DMX addresses so they don't clash. Selecting [Revert rig back](#) will put all the fixtures back to DMX Address 1, and not automatically change them again.

Lock Rig

By default, Lock Rig is disabled. However when enabled, "Lock rig" instructs RigSync to continuously and automatically revert any changes which are made to settings on fixtures that could affect the show – such as DMX Address, Pan/Tilt Settings or Personality/Mode. When changes such as these are made on a fixture, RigSync will detect them and revert them back. These changes can continue to be made from the console without disabling "Lock Rig".

Art-RDM

As well as RigSync using RDM on the DMX ports on the rear of the console to keep your console and fixtures synchronised, RigSync will also use RDM over Art-Net if Art-Net is enabled.

[Click here to find out more about Art-Net](#)

If Art-Net is enabled, pressing Discover All Fixtures will force Art-Net gateways to discover fixtures.

To go in depth on RDM, take a look at the session below...



https://youtu.be/F_6ANCol8dg

Sometimes, you may find that fixtures flicker, with the presence of RDM on the DMX line. If so, then unfortunately your fixtures are not truly DMX compliant.

To stop the flicker, you will need to remove RDM data from the fixture's DMX line. This can be done by either disabling RigSync completely, or disabling RigSync just on the DMX port the fixtures are connected to. Alternatively connect your non-compliant fixtures from a feed of a DMX Splitter with RDM removed.

Contact the fixture's manufacturer, to see if there is a firmware update to solve the flicker.



If you need to remove RDM from a DMX line, Splitter 8 has a switch to allow you to remove RDM data from the DMX Outputs. Watch the video to find out more.

[Click here to go to the Splitter 8 page.](#)

<https://youtu.be/ViBPm4DEbvk>

RigSync: The Concept

RigSync allows you to be completely unconcerned with the technical elements that allow consoles to talk to lighting rigs. RigSync doesn't simply read your rig or just patch your console, it manages your lighting rig with absolutely no interaction from you – ensuring your console and lighting rig are continuously synchronised and problem free by

automatically and invisibly solving potential disputes such as collisions in DMX address or changes of fixture mode.

In a large percentage of low to medium sized events and venues, technicians are not concerned with DMX addresses so long as their fixtures are functioning correctly. Often, settings such as DMX address, mode, Pan / Tilt invert etc are not discussed or decided upon until the build. In these situations, the DMX addressing and patch processes (both on the physical fixtures and the console) often delay progress and are inefficient, resulting in messy notes on the back of a set list or within a script margin, while the console op shouts up to a technician in a cherry picker or up a ladder, attempting to get the rig and the console synchronised. The console op often is interrupted from their programming to test a fixture's new settings or, even worse, having to use trial and error to find the address or mode of an inaccessible fixture.

We see these as unnecessary steps that delay the operator from designing and programming their show, resulting in an inferior show. This is especially prevalent for the low end users we now see adopting colour mix and movers for the first time.

With RigSync, ZerOS manages the rig – ensuring the console and lighting rig are synchronised, not just at the point of “patching” but continuously through the performance. RigSync is the first implementation of DMX, RDM and ArtRDM in a lighting console that allows the installer and operator to be completely unconcerned and oblivious to the technical elements that allow their consoles to talk to their lighting rig. New fixtures are automatically added, problems such as collisions in DMX addresses are automatically fixed, and settings such as modes and alignments are automatically kept in sync between the console and the rig. If a new fixture is added, ZerOS automatically assigns it settings, adjusting other fixtures if necessary to ensure the rig works. Patched fixtures which don't support remote management are avoided rather than ignored.

RigSync only changes settings when it's necessary to make the rig work. When the show is over, the user can choose to revert the rig back to its original settings, ensuring touring venues are left happy.

Users can choose to disable RigSync per output of the console, addressing issues often experienced on lower value equipment where the DMX & RDM specifications haven't been accurately implemented.

Desk Universes

Below the various protocol settings within the Universes tab, is a panel for each of the console's 64 "Desk Universes".

The 64 Desk Universe panels provide a method of fine tuning your outputs (for example, you could send the data for fixtures patched to "Desk Universe 5" to sACN Universe 5, Art-Net Universe 4 and DMX Output 1).



Within each Desk Universe panel, you can configure the four different control protocols for that desk universe – DMX, streaming ACN, Art-Net 4, and CTP (Capture).

For each of the control protocols within a Desk Universe, an **Add** button allows you to add another universe of that protocol. For example, you could have Desk Universe 1 being output to both Art-Net Universe 1 and 2 (or more). This might be useful when visiting a venue that uses Ethernet to DMX gateways, as you can have the same data from both Art-Net ports without having to reconfigure the venue's gateway.



If you add a protocol universe to a desk universe, which is already in use by another desk universe, you will receive a popup with the option to Cancel, or Use on this Desk Universe instead.

DMX

To edit which DMX Output port a Desk Universe is being sent from, click on the **Output** button below DMX in the required Desk Universe, or click **Add** to add another.



You can then choose which physical output port you wish this Desk Universe to be routed from. FLX series consoles have a pair of DMX outputs on the rear of the console.

You can also Remove the DMX output from this Desk Universe.

streaming ACN

To edit which streaming ACN universe a Desk Universe is being sent on, click on the **Output** button below streaming ACN in the required Desk Universe, or click **Add** to add another.



You can choose to send DMX data on any streaming ACN universe from 1 to 63,999.

You can also Remove streaming ACN universes from this Desk Universe.

Each sACN Universe has the option to set a custom priority, which is a value from 0 to 200. streaming ACN receivers will listen to the controller that has the highest priority value for the universe they are set to receive.



To change a streaming ACN universe's priority, press "Priority" and either enter the new number, or click "Default". Clicking default means this universe will then use the default streaming ACN priority value set in the global streaming ACN settings at the top of the Universes tab of Setup.

Art-Net 4

To edit which Art-Net universe a Desk Universe is being sent on, click on the **Output** button below Art-Net 4 in the required Desk Universe, or click **Add** to add another.



You can choose to send DMX data on any Art-Net 4 universe from 0 to 32,767. It is recommended to avoid using Art-Net universe 0 if you can, and start with Art-Net universe 1, to avoid any offset confusion.

You can also Remove Art-Net universes from this Desk Universe.

CITP

To edit which CITP universe a Desk Universe is being sent on, click on the **Output** button below CITP in the required Desk Universe, or click **Add** to add another.



You can choose to send DMX data on any CITP universe from 0 to 255.

You can also Remove CITP universes from this Desk Universe.

DMX



The DMX section of the Universes tab in Setup, allows you to configure the behaviour of the DMX ports of the rear of the console. FLX series consoles have two DMX ports.

If you are outputting DMX over the network, and you are not using the DMX ports, it is possible to disable them.

DMX Out

By default, DMX port 1 outputs Desk Universe 1 and DMX port 2 outputs Desk Universe 2 (on 1 Universe FLX S consoles, both DMX ports output Desk Universe 1). This means as soon as a fixture is patched onto universe 1, DMX will be output from DMX port 1.

To configure which Desk Universe is sent from a DMX Output, scroll down to the "Desk Universe" you need. You can then add a DMX port to the Desk Universe, so that the Desk Universe is then sent from the chosen DMX Output.

[Click here to find out more about routing Desk Universes out of your console](#)

When a DMX port is configured as a DMX Output, a RigSync switch will be shown for that port, allowing you to Disable or Enable RigSync on that port. For example, both DMX Outputs could be sending the same Desk Universe, however one with and one without RDM data.

RigSync must be enabled globally, to allow RigSync to be enabled on either DMX output.

[Click here to find out more about RigSync](#)

DMX In

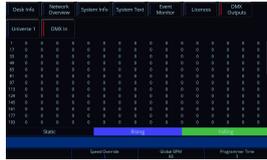


Either of the console's DMX ports, can be configured as a DMX Input rather than an output. Using a male-to-male XLR adapter, this allows you to send a DMX signal into your console from an external DMX source, which can then be used to control fixture intensities, or playback levels.

Only one DMX port can be used as an input at a time.

[Click here to find out about controlling fixture intensities with DMX input](#)

[Click here to find out about controlling playback levels with DMX input](#)



Once a DMX port is configured as a DMX Input, the incoming DMX can be viewed in Z -> System Information -> DMX Outputs -> DMX In

FLX series consoles will only receive DMX from DMX sources that send a whole DMX universe. DMX controllers that only send the first few channels, for example a Zero 88 Level 6, will not work.

Vision.Net



FLX series consoles can receive Vision.Net commands over RS-485, using either of the DMX ports. Once you have chosen the DMX port you wish to receive Vision.Net messages, you can then configure Vision.Net in the Triggers tab of Setup.

A Vision.Net to XLR adapter is required with the following pinout:

Vision.Net 9-Pin connector:

1. Data +
2. Data -
3. (nothing)
4. 24V
5. COM
6. 24V
7. COM
8. 24V
9. COM

[Click here for information on configuring Vision.Net](#)

Transmission

You can change the DMX Transmission between Continuous or Delta. Continuous transmission will result in DMX data being sent at a steady refresh rate, and is the default option. FLX series consoles transmit at 29Hz.

Changing the Transmission to Delta, will result in the console sending DMX "updates". This means DMX frames will be sent whenever there are level changes on the console. If there are no level changes, DMX will be transmitted at 1Hz. If you are controlling a fixture that doesn't seem to be responding correctly, change the Transmission to see if the fixture prefers the change in frame rate. If it does, your fixture is not truly DMX compliant.

Reset to Defaults



If you have configured individual Desk Universes, you can press the Reset to Defaults button to reset the DMX Outputs to their default settings.

Take a look at the session below for some DMX theory...



https://youtu.be/F_6ANCol8dg

Art-Net

Art-Net 4 is a lighting protocol which sends DMX data over Ethernet. The protocol allows for multiple DMX universes to be sent over a single Ethernet cable.

[For more information, click here to head to the Art-Net website](#)



Within the Art-Net 4 panel, you can choose to enable Art-Net 4. Once enabled, you will be able to configure the Art-Net 4 protocol.

By default, Art-Net 4 universes will be mapped 1:1 with Desk Universes.

[To customise your universe routing, click here to find out about Desk Universe configuration](#)



If you have changed the Art-Net 4 settings per Desk Universe, you can choose to “Reset to defaults”. This will prompt you to start the Universe numbering from either Art-Net Universe 0 or Art-Net Universe 1. Technically the first available Art-Net 4 universe is “Universe 0”, but on modern devices it’s usual to ignore Universe 0, and start at Universe 1 – providing a “1-to-1” numbered universe patch, rather than an offset of 1.

IP Address

The IP address options will allow you to configure your Art-Net network settings. You can choose between using a DHCP address, a static IP address, or a Primary/Secondary IP address.

The Primary/Secondary IP address are predefined IP addresses, in the format 2.x.x.x for the primary, and 10.x.x.x for the secondary (both with subnets of 255.0.0.0). Many Art-Net devices default to either a 2.x.x.x or 10.x.x.x IP, and so the Primary and Secondary option are quick ways to get you communicating with Art-Net devices with as little configuration required as possible.

Art-Net will be set to use the Primary (2.x.y.z) IP address by default.

Art-Net 4 traffic is mostly transmitted as “Unicast” data.

[For information on network settings, see the Networking chapter](#)



<https://youtu.be/L-dl4ZLf1gs>

Once you have transmitted your Art-Net data from the console, you can then send it to your fixtures over Ethernet. Often, Art-Net universes are then converted back to DMX universes, using an Ethernet to DMX Gateway.

Zero 88 manufacture Gateway 4 and Gateway 8 Ethernet to DMX Gateways.

[Click here to head to the Gateway 4 page.](#)

[Click here to head to the Gateway 8 page.](#)

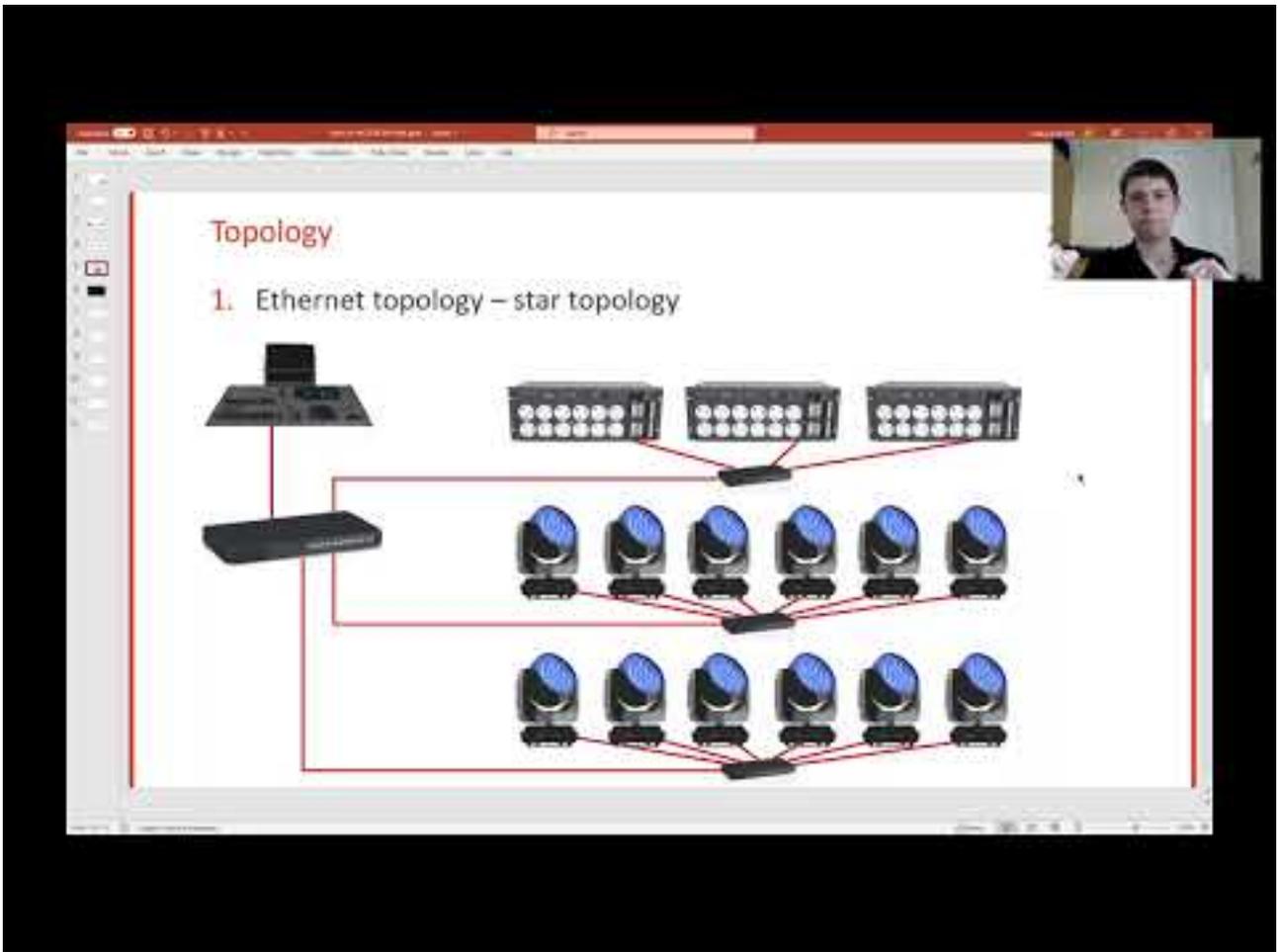
Watch the video here for an overview of Gateway 4 and Gateway 8.

Once Art-Net has been enabled, and network settings configured, any Art-Net devices that your ZerOS console can see, will be displayed in the Devices tab of Setup. [Click here to find out more.](#)

Once Art-Net has been enabled, ZerOS will tell other controllers on the network which Art-Net universes are currently being transmitted. ZerOS uses the Art-Net OEM code of 0x2BFE.

The console's Desk Name, set in Setup -> Settings -> Desk Name, is reported as the console's Art-Net name. This cannot be edited by other Art-Net devices.

Take a look at the session below for an introduction to Art-Net...



<https://youtu.be/WSBGaCqnKHM>

CITP

CITP is a lighting protocol which sends DMX data over Ethernet. The protocol allows for multiple DMX universes to be sent over a single Ethernet cable, and has been designed specifically for communication between lighting consoles, visualisers and media servers.

CITP is primarily used to connect ZerOS to Capture visualisation software. When connected using CITP, ZerOS & Capture integrate seamlessly, allowing for two-way control and selection communication. Therefore if using Capture visualisation software, we recommend using the CITP protocol.

[CITP data can be sent from Phantom ZerOS PC software to Capture visualisation software without the need for a Phantom ZerOS Unlock Dongle.](#)

[For more information on Capture Visualisation software, click here](#)

[For more information on the CITP protocol, click here](#)



Within the CITP panel, you can choose to enable CITP. Once enabled, you will be able to configure the CITP protocol. By default, CITP universes will be mapped 0:1 with Desk Universes.



If you have changed the CITP settings per Desk Universe, you can choose to “Reset to defaults”. This will prompt you to start the Universe numbering from either CITP Universe 0 or CITP Universe 1. If using Capture visualisation software, Start at CITP Universe 0.

IP Address

The IP address options will allow you to configure your CITP network settings. You can choose between using a DHCP address, or a static IP address.

CITP will be set to DHCP by default.

[For information on network settings, see the Networking chapter](#)



Selection

When using CITP to communicate with Capture visualisation software, as well as DMX information being sent over Ethernet from ZerOS to Capture, selection information is sent too. Selected fixtures are then indicated in Capture with the fixtures selecting in red.



External Level Set

When using CITP to communicate with Capture visualisation software, as well as ZerOS sending DMX information to Capture, Capture can send DMX information back to ZerOS. This allows you to use the fixture controls in Capture to control your fixtures, which you can then record as a cue in ZerOS. You will see the parameter values live updating in ZerOS, and "External Level Set" will be displayed in the command line, as ZerOS receives the updates from Capture.

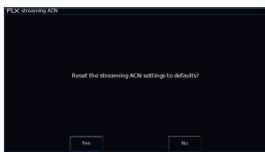
In Capture, when you have moving lights selected you can right-click on a position on stage, and your moving lights will move to that location. Therefore connect your ZerOS console to Capture with CITP, and in Capture right click on the location you want your movers to go to. Then record that as a cue or palette in ZerOS.

streamingACN

Streaming ACN (sACN) is a lighting protocol which sends DMX data over Ethernet. The protocol allows for multiple DMX universes to be sent over a single Ethernet cable. The protocol is approved by ANSI and ESTA as the standard for DMX over Ethernet and allows ZerOS to communicate with a multitude of sACN enabled devices already available from a range of manufactures.



Within the sACN panel, you can choose to enable sACN. Once enabled, you will be able to configure the sACN protocol. By default, sACN universes will be mapped 1:1 with Desk Universes.



Reset to Defaults

If you have changed the sACN settings in individual Desk Universes, you can choose to “Reset to defaults” (which outputs each Desk Universe on the equivalent number sACN Universe).



Default Priority

Transmitted sACN universes can be defined a priority level (0-200). sACN receptive devices will automatically listen for the highest priority number received and respond to that signal. In this way, multiple consoles can be running on a network at the same time and can automatically take over from one another. Each sACN universe can have its own Priority configured in each Desk Universe panel, or can be set to use the “Default priority” listed in the sACN panel.

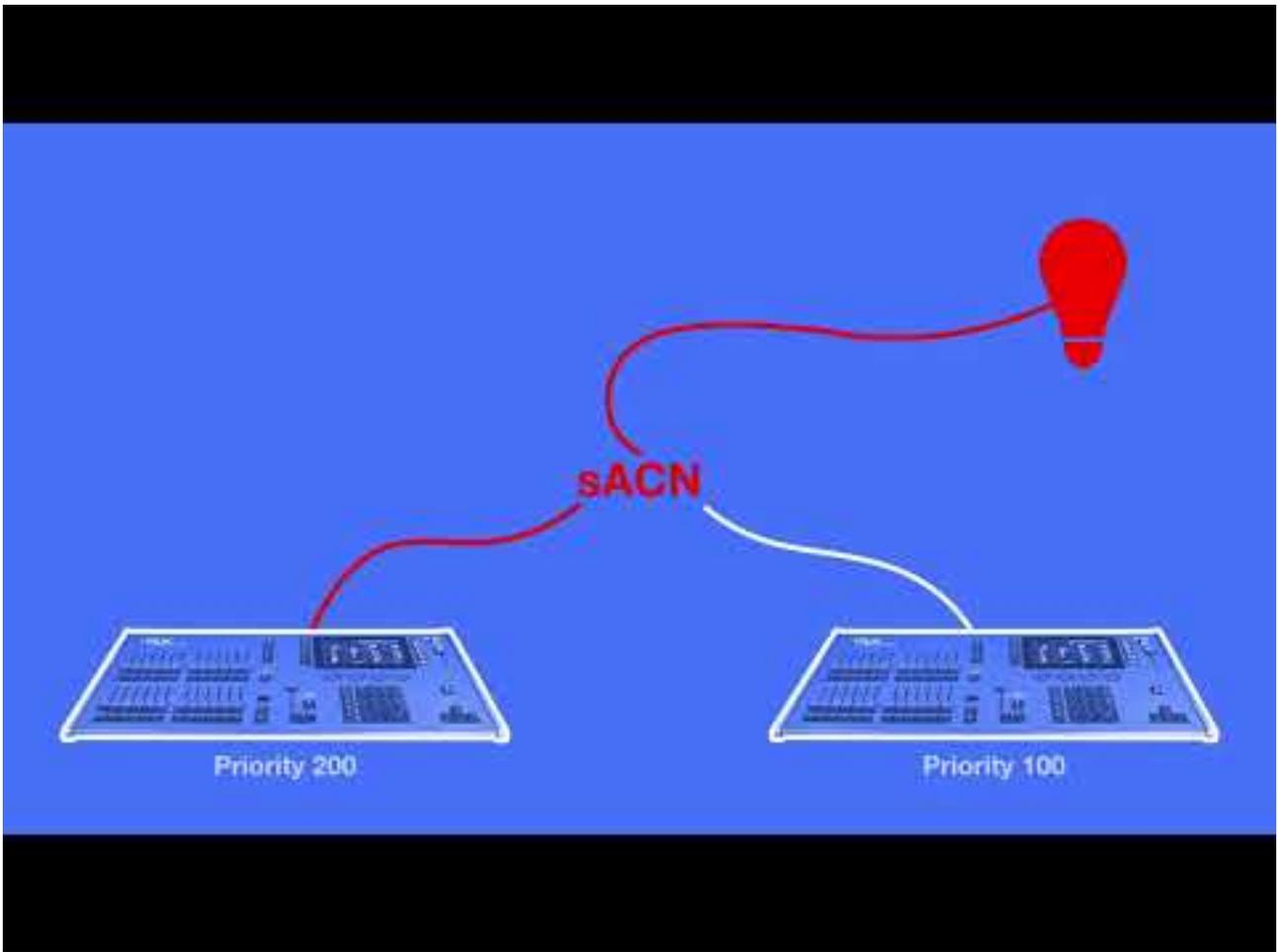
IP Address

The IP address options will allow you to configure your sACN network settings. You can choose between using a DHCP address, or a static IP address.

sACN will be set to DHCP by default.

[For information on network settings, see the Networking chapter](#)

Take a look at the short video below for an explanation of sACN...



<https://youtu.be/AIBMe9XvK94>



<https://youtu.be/L-dl4ZLf1gs>

Once you have transmitted your sACN data from the console, you can then send it to your fixtures over Ethernet. Often, sACN universes are then converted back to DMX universes, using an Ethernet to DMX Gateway.

Zero 88 manufacture Gateway 4 and Gateway 8 Ethernet to DMX Gateways.

[Click here to head to the Gateway 4 page.](#)

[Click here to head to the Gateway 8 page.](#)

Watch the video here for an overview of Gateway 4 and Gateway 8.

Take a look at the session below for an introduction to streaming ACN...

Topology

1. Ethernet topology – star topology

The diagram illustrates a star topology network. At the center is a single switch. Three other switches are positioned above it, each connected to the central switch. Below the central switch, there are two rows of six laptops each, all connected to the central switch. To the left of the central switch, a laptop and keyboard are also connected to it. A video call window in the top right corner shows a man speaking.

<https://youtu.be/WSBGaCqnKHM>