



# Delta Media Server

## Controlling Art-Net DMX Devices

User Guide



## Controlling Art-Net DMX Devices : User Guide

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## Introduction

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**DMX** is a serial protocol used to control many lighting systems, bubble, and smoke machines and other stage effects devices.

**Art-Net** is DMX over Ethernet, the protocol that DeltaServer uses to interface with external devices, so we need to convert the Art-Net signal into DMX.

An Ethernet cable carries the Art-Net signal to and from a converter (e.g. Enttec box), which converts to DMX over XLR cable to the first device: other DMX devices can then be connected in a serial / daisy-chain format, one to the next.



## Addressing DMX Devices

Your devices receive messages from DeltaServer according to the **DMX Base Address and their respective Delta channels**.

Each Base Address can be any number within range (0-511) but should be unique for independent devices: it should not coincide with any other base/channel number unless this is the requirement (e.g. multiple devices listening to the same part of the addressed block).

Plan your device requirements:

For example, **Light 1** has base address of 1 and can have 4 Delta output channels:

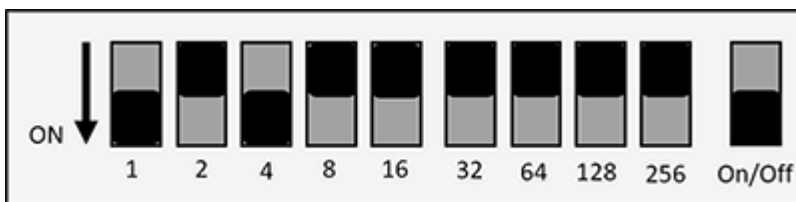
- Red channel 1 (values 0–255)
- Blue channel 2 (values 0–255)
- Green channel 3 (values 0–255)
- Brightness channel 4 (values 0–255)

Light 2 can then start at base address 5 and take up 4 channels, and so on.

Further instructions for addressing specific devices may be found in its manufacturer's user manual.

### DIP switch settings

The example below shows a DIP switch chart denoting that this light is ON (switch 10) with a base address of 5 (switches 1 and 3):



A device set-up might look like this:



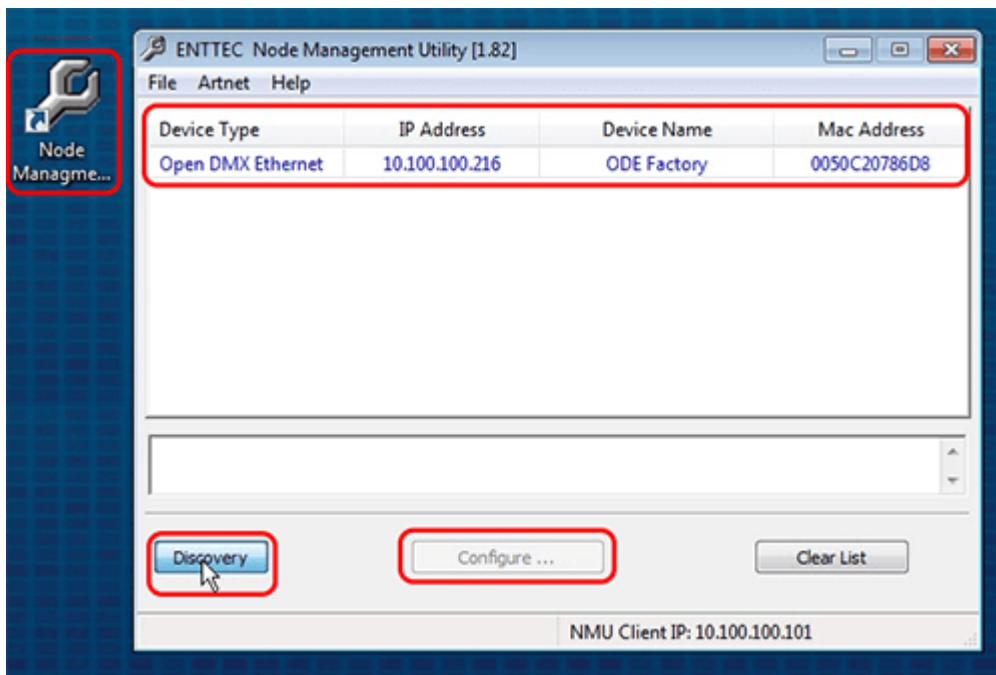
**ArtNetominator** is a free facility to help you to set up and troubleshoot your Art-Net devices:  
<http://www.lightjams.com/artnetominator/>

## ENTTEC Node Management

This page describes the ENTTEC OpenDMX Ethernet (ODE) Mkl. Operation of the Mkl is the same, but the software app for configuration (v1.8 on) operates in a browser page.

The server must be set up with the correct software for the DMX converter – we use ENTTEC Node Management Utility.

- Connect the ENTTEC box to the server NIC (or via network) with an Ethernet cable.
- Connect the first device to the ENTTEC box using XLR cable.
- Connect each device to the next using XLR cables.
- Open the Node Management software.
- Click the 'Discovery' button:



The attached ENTECC box will show listed under Device Type with its IP Address, Device Name and Mac Address.

- Click to select the device and the 'Configure' button will become active. Click it.

The screenshot shows a software window titled "ODE Configuration" with a "General Settings" tab. The main section is "ODE Parameters Configuration" and contains the following fields and controls:

- Device Name:** Text input field containing "ODE Factory".
- IP Address:** Four numeric input fields containing "10", "100", "100", and "216".
- Protocol:** A dropdown menu set to "ArtNet".
- Subnet:** A dropdown menu set to "00".
- Universe:** A dropdown menu set to "00".
- Port Direction:** A dropdown menu set to "Output DMX".
- Refresh Rate:** A dropdown menu set to "Max." and a "Change Refresh Rate" button.
- Buttons: "Save Config", "SEND Art-Net ...", and "Update Firmware ...".
- At the bottom: a text input field "enter plugin key here" and an "Authorize Plugin Key" button.
- A link: "[Click here to visit ENTTEC website to buy / browse ODE plugins](#)".

- The correct details should default in, but you should check:
- **IP Address** is correct and is on the same range as the server (if it is on a different range, the server can get confused and may show the device IP in its front panel instead of its own).
- **Protocol:** Art-Net
- **Subnet** and **Universe** can be set to what you want – the default for both is 00. Check/set your Subnet and Universe here, and make sure they match in Delta.
- **Port Direction:** Output DMX



## Universes and Subnets

Each ENTTEC box is addressed to a Universe and Subnet (to allow for more physical channels if required) on a network.

DeltaServer can read from up to 16 Universes (512 channels each), with up to 16 Subnets (512 channels each) for Art-Net INPUT via (for example) a Showtec console.

For Art-Net OUTPUT, DeltaServer outputs to a single Universe/Subnet as set in *Preferences > ArtNet & DMX*.

Each independent output device (light, effects machine) should be addressed with a unique Base Address + a Delta channel for each set of values it requires (e.g. R, G, B, Brightness for lights = 4 Delta Channels).

Each Delta device output can have a value of between 0 and 255 (8 bit) but this can be extended by allocating 2 (16 bit) or 4 channels (32 bit) to match the device characteristics.

Some devices such as smoke or bubble machines only require a single Delta channel output: On = 255 and Off = 0.

## Configure Art-Net Output in DeltaGUI

Check the configuration in DeltaGUI matches your set-up. In DeltaGUI, select *Configure > Preferences* and go to 'ArtNet & DMX'. For the exact representation, see the Delta User Guide for your version on [our user portal](#).

Preferences : 'Delta3579' at 10.100.101.230.182

**Art-Net\_DMX**

Output Art-Net

Output Art-Net Data Enable

Art-Net: 10.100.150.18 : SonicWALL Virtual NIC

Broadcast Address: 255 . 255 . 255 . 255 (Output) Default : 255.255.255.255

Art-Net: 0 (Output) Default : 0

Art-Net SubNet: 0 (Output) Default : 0

Max Channels: 512 (Output) Default : 512

Broadcast Port: 6454 (Output) Default : 6454

Input Art-Net

Input Art-Net Data Enabled Art-Net: 10.100.150.18 : SonicWALL Virtual NIC

Receive Port: 6455 (Input) Default : 6455

Enable TestMode  Increments all DMX

OK

Cancel

Tick to enable 'Output ArtNet Data'.

Check that the Art-Net NIC IP is the correct NIC to the Enttec box

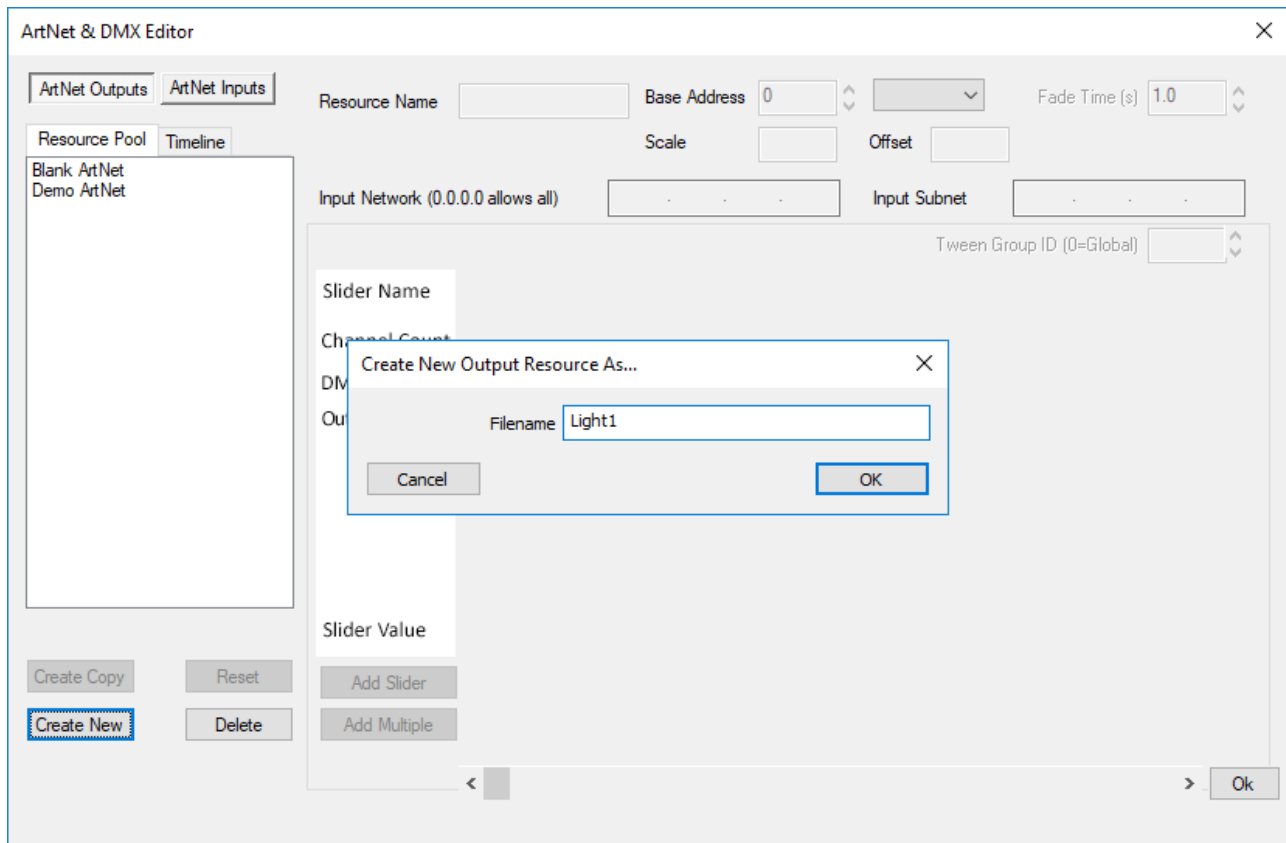
Type in the correct Universe and SubNet for which Art-Net output should be enabled.

**Note:** if you tick 'Enable TestMode', Delta will send a message out to ALL channels available and so all your devices should respond. Untick this box to stop/reset.

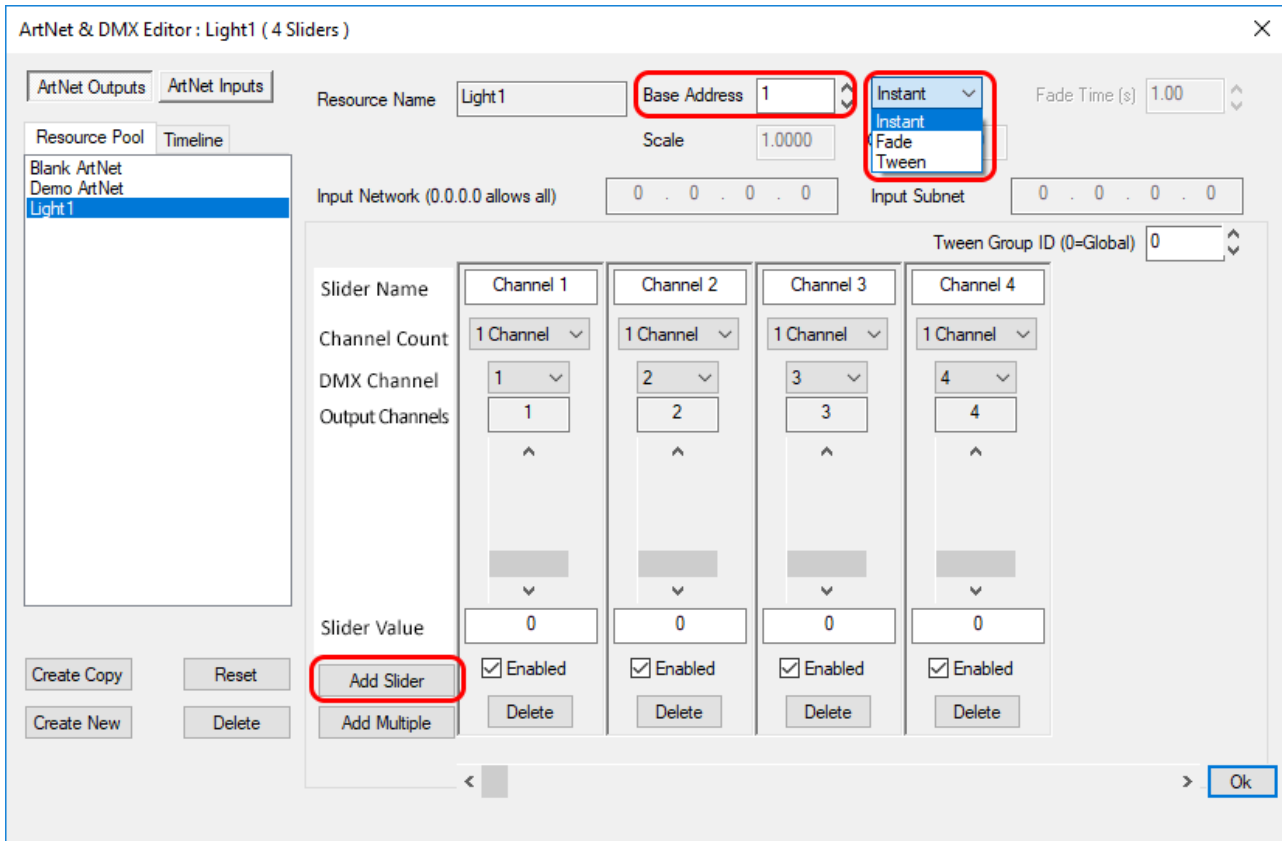
## Create DeltaGUI Resource

Set up a new DeltaGUI resource for each of the devices you are using:

From the top menu bar in DeltaGUI, select *View > ArtNet & DMX Editor*:



Click Create New and name your resource. Click OK and select your new resource:



- Set the **Base Address** to that of the device (i.e. the first channel number)
- Select between **Instant**, **Fade** or **Tween** where:
  - Instant = immediate, single event within the chosen Tween Group
  - Fade = values (e.g. light colours) will fade down from current setting (note should not be mixed with other Instant or Tweened devices)
  - Tween = values (e.g. light colours) will go between the previous and 'this' setting within the chosen Tween Group
- Click '**Add Slider**' to add each channel required for that device.
- Choose the **Channel Count** (1,2 or 4) for that slider and the Output Channel start. The Channel Count allows the range to be expanded further for devices that support more than 8-bit; a single channel can give values of 0–255 (8-bit) but 2 channels can give a range of 0–65535 (16-bit), 4 channels give a range of 0-4,294,967,295 (32-bit).

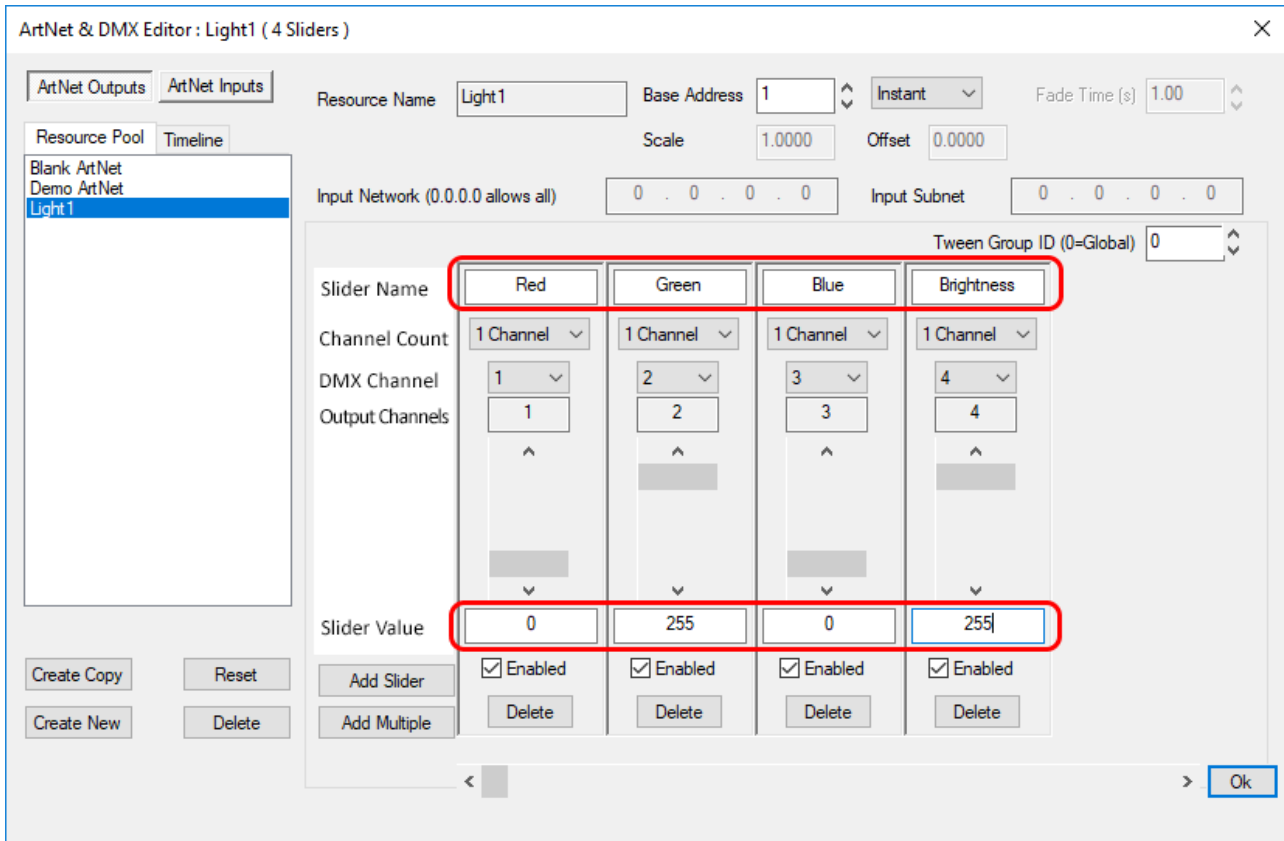
## Name and Set Sliders

You can leave the Slider Names as their default names, or re-name them according to what they relate to on the device. In this case, Light 1 has 4 channels, starting at Base Address 1:

- Red (output ch 1)
- Green (output ch 2)

- Blue (output ch 3) and
- Brightness (output ch 4)

RGB channels are usually consecutively numbered for most lights.



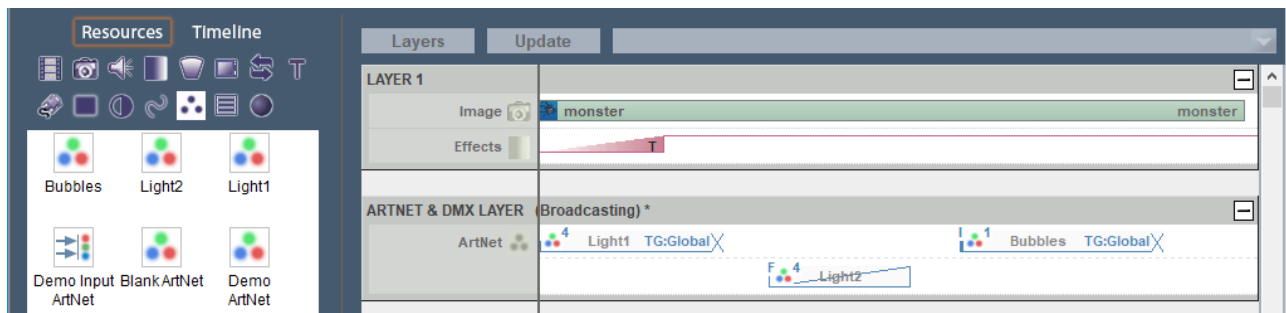
This light is set to switch on instantly to full (value 255) brightness and full green when it is triggered in the timeline. Red and Blue are off (value 0). The grey sliders can also be dragged up or down with the mouse.

A smoke or bubble machine would only have a single channel with values 255: On, 0:Off.

Some devices may behave in different ways, for example some lights have an uppermost limit of, say, 210. If the slider goes above that limit it may tell the light to flash on-off, or to kill the output, depending on device settings. This information should be found in the manufacturer’s user guide.

## Using Art-Net Timeline Resources

Once you have set up your resources they will appear in the resource pool, available to the timeline. As with other resources, drag and drop them onto the timeline, then right-click to configure them with the Resource Editor:



Before any Art-Net resources are placed on the timeline, all values for a DMX device are 0.

Whilst an Art-Net resource can have a Fade duration, it is essentially just a start trigger to change the current status of a DMX device to another status, using resource properties. In the example above, the Light2 resource is set to a fade; it is moved down in the layer because a fade can have overlapping duration with other events.

### Fade Effect

- The Fade effect fades to the colour selected over the set time.
- If you want to fade down to a colour, set the first instance to the colour that you want, then set another instance with sliders at the new values.

Remember that Fade type Art-Net resources are not compatible with Tween or Instant, so do not use a mix of Fade with any other type.

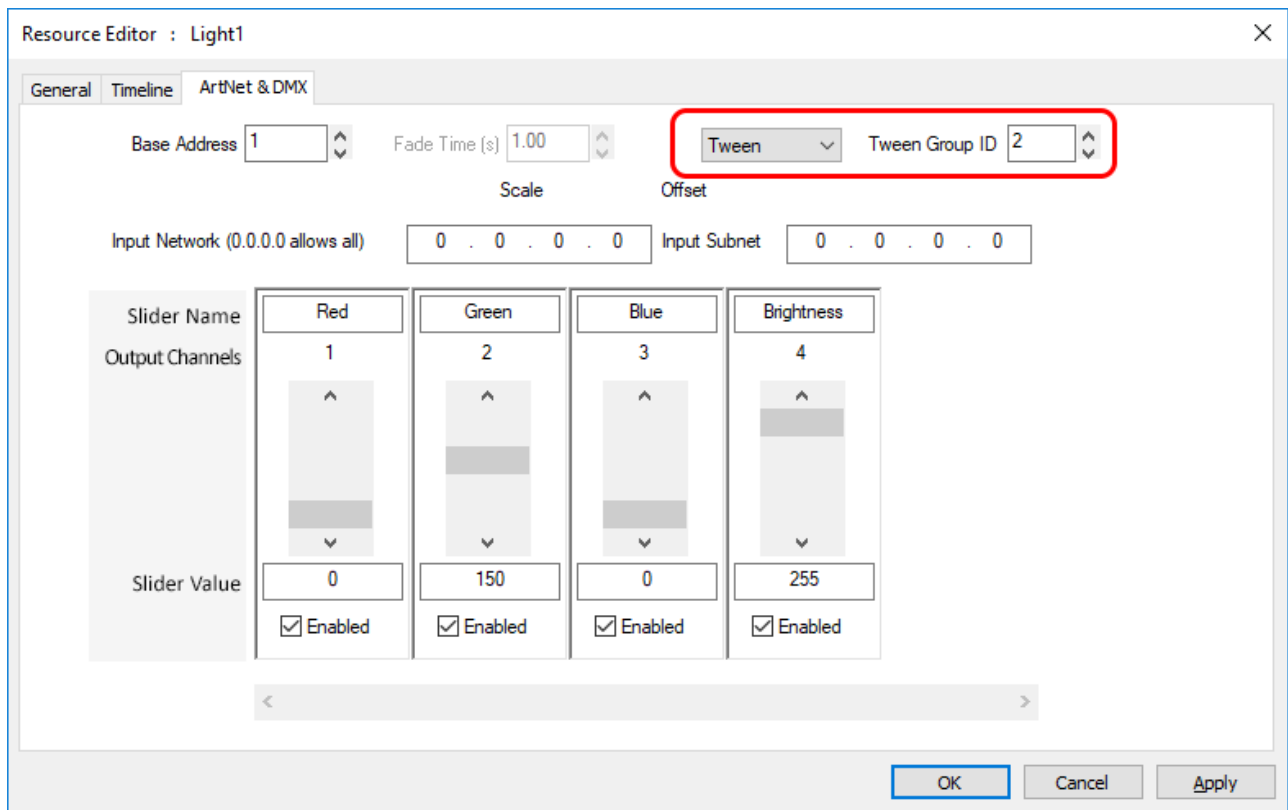
### Tween Effect

The Tween effect will gradually change a light from the colour of the current instance to that of the next:



If the first instance of **Light1** is set to RGB 0, 255, 0 (green) and the next instance of **Light1** is set to RGB 132, 41, 187 (purple), it will transition smoothly from green to purple over the time separation between the two resources on the timeline.

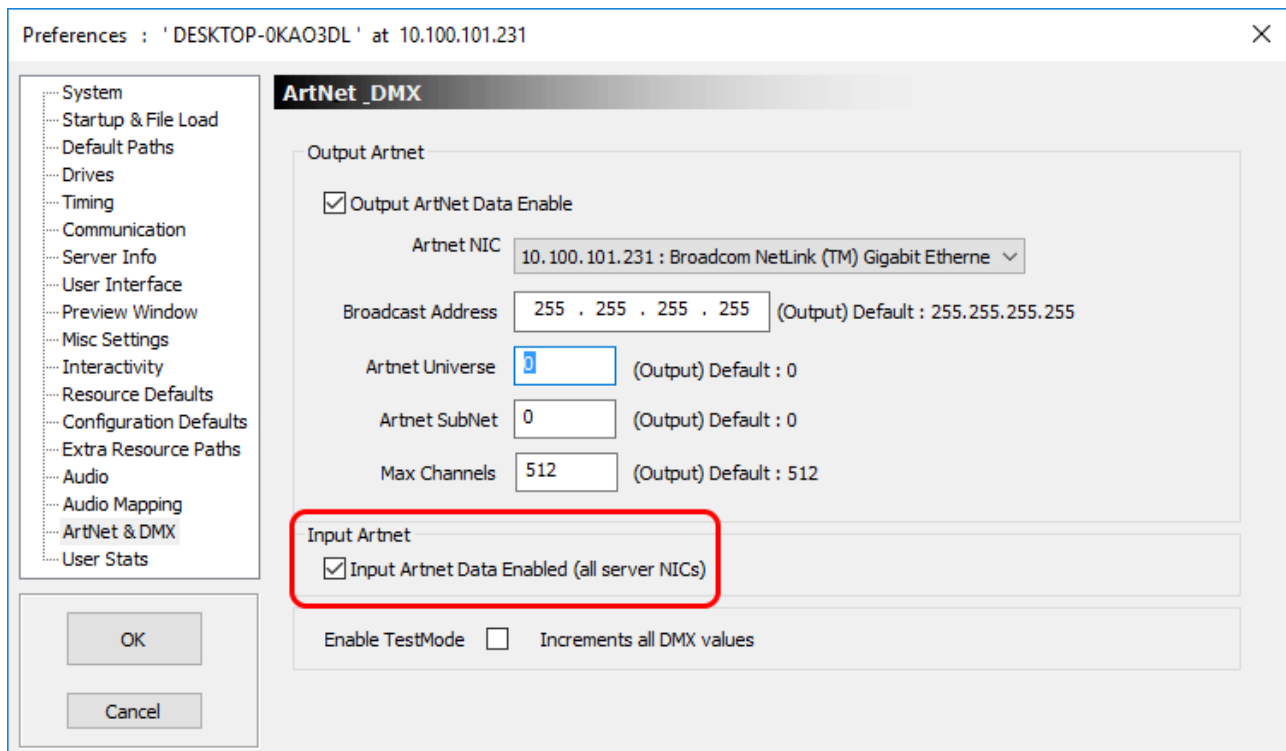
All Tween and Instant type Art-Net resources can be placed in a  **Tween Group**  in order to separate different tweening effects:



## Configure Art-Net Input in DeltaGUI

Delta can also receive Art-Net input values from an external source (for example a control desk), which can be used to trigger real-time commands for media playback. These commands could be to adjust media colour, position on screen, rotation or any other Delta sequence command. Input Art-Net resources can be configured to any universe / subnet (up to 16 of each).

In DeltaGUI, select *Configure > Preferences* and go to 'ArtNet & DMX'.

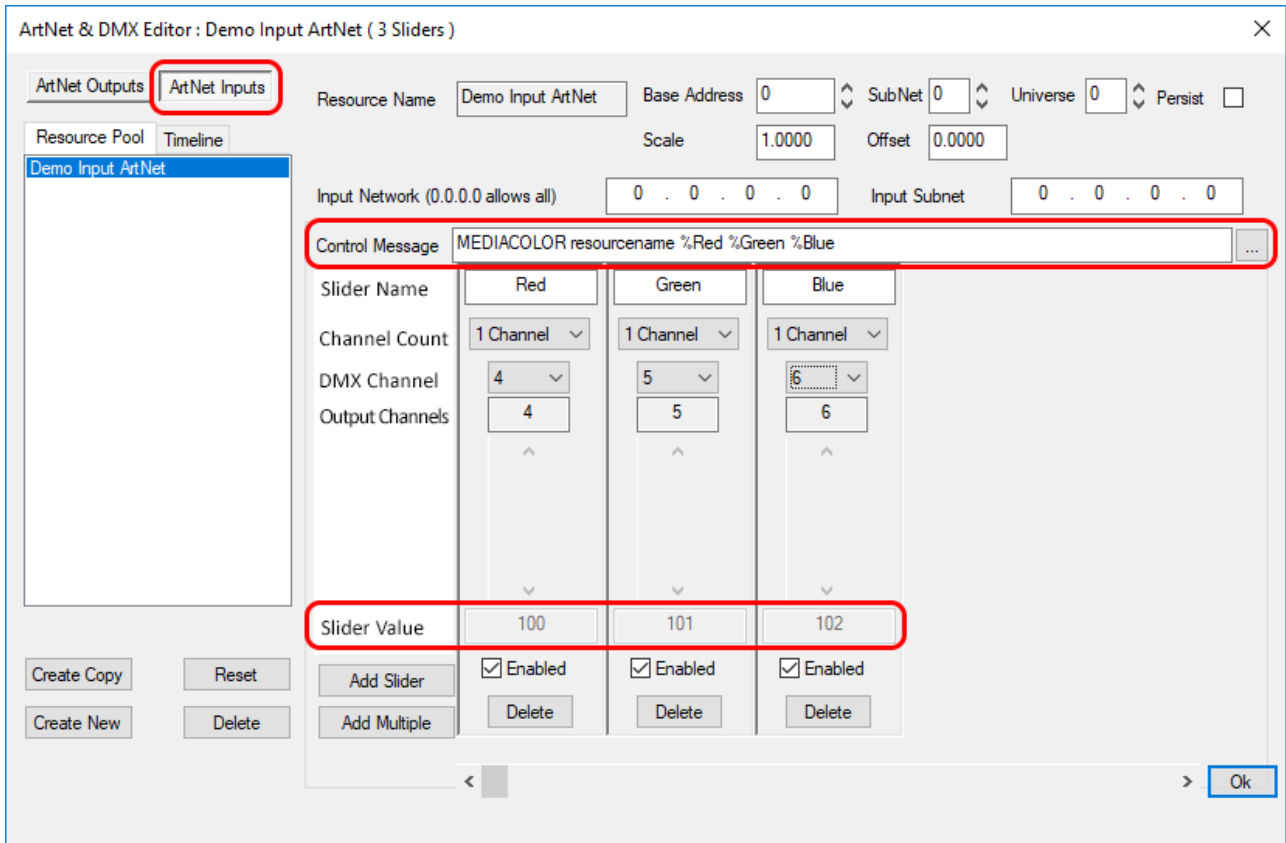


The values from the selected DMX channels are substituted into placeholders in order to create the command string sent into Delta.

In the example shown, the sliders are named Red, Green, Blue – the values from these input channels (4, 5, 6) replace the placeholder strings %Red %Green %Blue, so the command sent within Delta in this example is:

**Mediacolor mymedia 100 101 102**





This command will trigger real-time changes of the selected channels at any time: apply values to (for example) colour, or rotation, of specific media resource, which will trigger as the control slider is moved.

Note that you can also offset and scale the channel values using those edit boxes. The order of execution is offset, then scale.

**offset**

add a fixed value every time to this input

**scale**

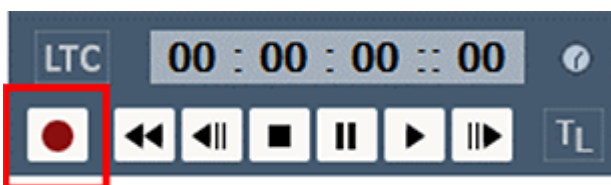
add a relative value every time to this input

## Art-Net Recording

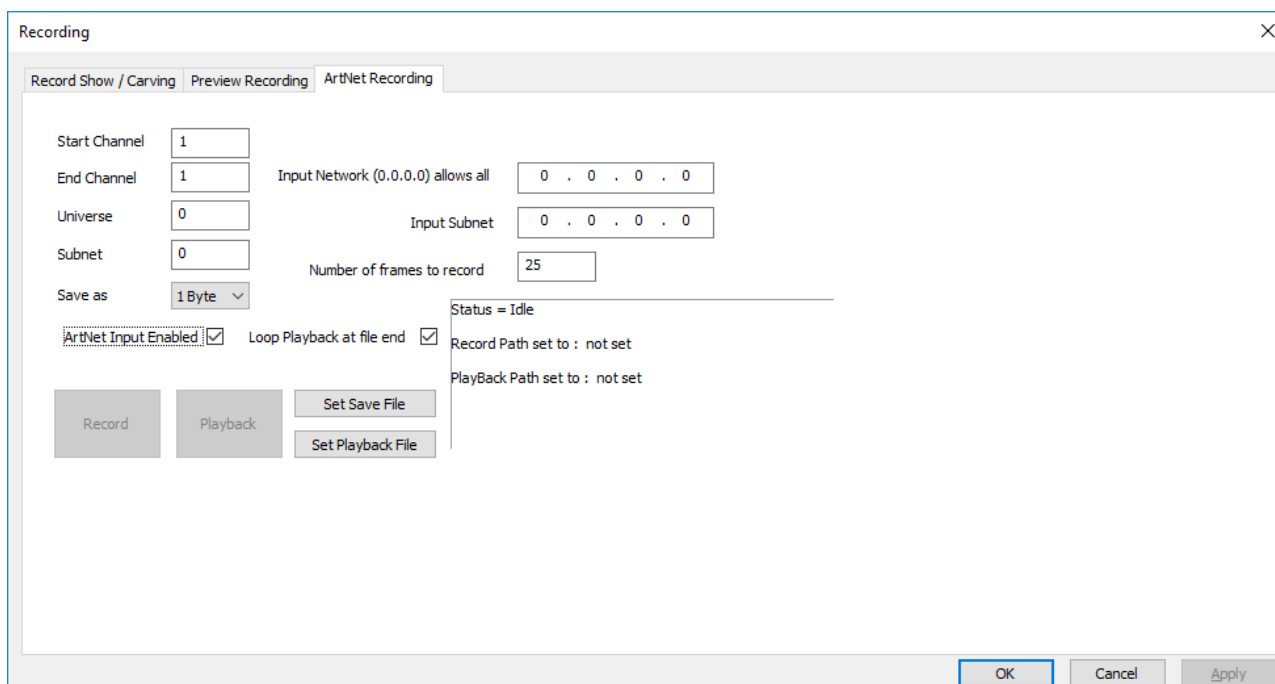
For recording in Delta, see the [Delta User Guide on recording generally](#).

Art-Net recording enables Art-Net inputs to be recorded and then rerun in simulation scenarios. This may be useful in optimising inputs, or to allow inputs to be simulated as shows are developed.

To set up recording, click the red Record button on the timeline controls:



Select Art-Net Recording:



### Start

first DMX channel to record

### End

last DMX channel to record (recording includes all channels between Start and End)

### Universe

Universe being recorded

**Subnet**

Art-Net Universe being recorded

**Save as**

the number of bytes which make up a data point to be recorded

**Input Network**

The IP from which the recording is being listened to

**Input Subnet**

The IP subnet being listened from

**Number of frames to record**

This is the number of Art-Net frames to record (not movie frames).

**ArtNet Input Enabled**

This is essentially the same checkbox that can be found in *Config > Preferences > ArtNet & DMX* to enable Art-Net input.

**Loop playback at file end**

Plays the Art-Net recording continuously until playback is cancelled.

**Set Save file**

Set the file to record to. When this is set, and Input is enabled, the Record button becomes available.

**Set Playback File**

The file to be read from, in order to playback Art-Net. Once this is set and Art-Net input is disabled, the PlayBack button becomes available.

**External Controls**

Use the [External Control](#) (listed under 'Recording Commands'): ARTNET\_RECORD.

With this control you can set any of the Art-Net recording parameters. Use Recording Mode to change whether you're recording, playing back or neither. Note, you will need to ensure you are in the correct Art-Net input/output mode, See ARTNET external control (listed under 'Media Commands').

*Example:*

```
artnet_record StartChan=1 EndChan=13 Universe=3 Subnet=2 ByteRange=2 InputIP=192.168.71.10  
InputIPSubnet=255.255.255.0 NumberFramesToRecord=80 SaveFile=C:\Movies\Record\art_test.txt  
PlayBackFile=C:\Movies\Record\artnetrec.txt RecordingMode=Idle LoopPlayback=true
```

**Note:** Save and PlayBack files are .txt files.

## Document Information

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July 2016	1	Delta 2.4	PowerPoint	Ian Macpherson
July 2017	2	Delta 2.5	Re-written and re-illustrated	Andie Davidson
February 2018	3	Delta 2.6	Art-Net recording added	Andie Davidson
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