

version 2016.45

# xLights

## *User Manual*

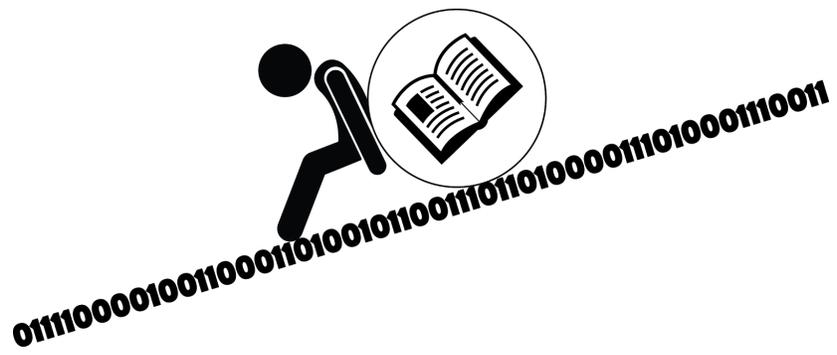
  
40+ effects

  
Multiple Layouts

  
Light Sequencer

  
Show Scheduler

  
Cross-platform  
Windows  
Mac  
Linux





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## New Content

This section highlights the content that has been included or updated in this release of the manual.

1. Several corrections and additional comments added based on feedback from a developer.
2. Updated the Getting Started , Installation and Setup sections with additional commentary .
3. Updated commentary on how xLights locates images where the folder names are different.
4. Updated the Setup section to include details of the FPP universes file .
5. Updated commentary on the use of additional preview windows.
6. Updated commentary in the Layout section.
7. Added the State Effect functionality. Add the State attribute to all Model layouts.
8. Added View log functionality.
9. Updated the backup functionality description in several places.
10. Package Problem files has changed to 'Package Log Files'.
11. Updated the Model Export functionality.
12. Added the DMX Model functionality.
13. Added the Polyline Model functionality
14. The Icicles model has been updated to add add Left/Right starting locations for Icicles.
15. The new sequence wizard functionality has been updated to allow selection of a view or all models.
16. Updated the Backup functionality and added process to recover files.
17. Added new #x.y format for specifying start channel x = universe, y = channel within universe.
18. Added timing track renaming on sequencer window.
19. Added functionality to export video of a model's effects.
20. Add functionality to export/import \*.xpreset preset files. A count of the effect layers is displayed in on presets window.
21. Added new options to the Fill Effect: Band Size, Skip Size, and Offset.
22. Added functionality to alignment effects.
23. Updated the Import Effects - xLights xml functionality.
24. Added metronome fixed timing interval timing track.
25. Added Import Notes functionality to create Notes timing tracks.
26. Added color curves functionality.
27. Added Roto-Zoom functionality.
28. Added Timing Event Jump effect to the VU Meter effect.
29. Added functionality to scroll the waveform/grid left or right.
30. Added functionality to enable multiple selected effects to be moved up/down and nudged left/right.
31. Added functionality to define multiple layers for Strands.
32. Added functionality to the Poly Line model to create curved segments.

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## Chapter One: Introduction

### Acknowledgements

### Preface *from Sean Meighan*

### History

xLights

Nutcracker



## Acknowledgements

The developers and authors of this manual are volunteers. A very special thanks goes out to our families for supporting us in this hobby. Without your support we could not do this. A very special thanks goes out to Matt Brown and Sean Meighan, the original authors of xLights and Nutcracker.

## Preface from Sean Meighan

Welcome to the xLights User Manual. We hope that you will find the information that you need to make your Halloween and Christmas shows shine!

## History

### xLights

xLights was created by Matt Brown in 2010. Matt wanted a program that would reliably play his LOR show. The original xLights was “only” a scheduler/player. It had sophisticated playlists, ability to play videos, mp3 and wav files. Matt created a process to support Renard, Pixelnet, E1.31 (Sacn), LOR, DMX and Open DMX controllers. There was a built in CONVERT tab to change LOR lms files into xLight XSEQ files.



### Nutcracker

1.x/2.x The original Nutcracker was released in February 2012 by Sean Meighan. Version 1.0 and 2.0 were a web based, php application.

3.x In December of 2012, Matt Brown asked Sean if he could port the Nutcracker code into xLights. The result was xLights 3.0.

4.x Sean had discussions with Dave Pitts about making a horizontal timeline, sound file waveform and drop effects. Dave coded up the first Alpha xLights 4.0 in November 2014. In January 2015, Gil Jones and Dan Kulp came on to the team and took over the development from Dave. With the release of 4.3, Sean announces xLights version 4.x is now a production release and drops the reference to ‘Nutcracker’.



## Chapter Two: Quick Start Guide

### Getting Started

Defining the Show and Media Directories

Network Definition

Layout and Background Image Definition

Window Definition

Model Definition

Model Group Definition

Creating a New Sequence

Adding Models to a View

Adding Effects Against a Model

Saving the Sequence

Backup and Exit

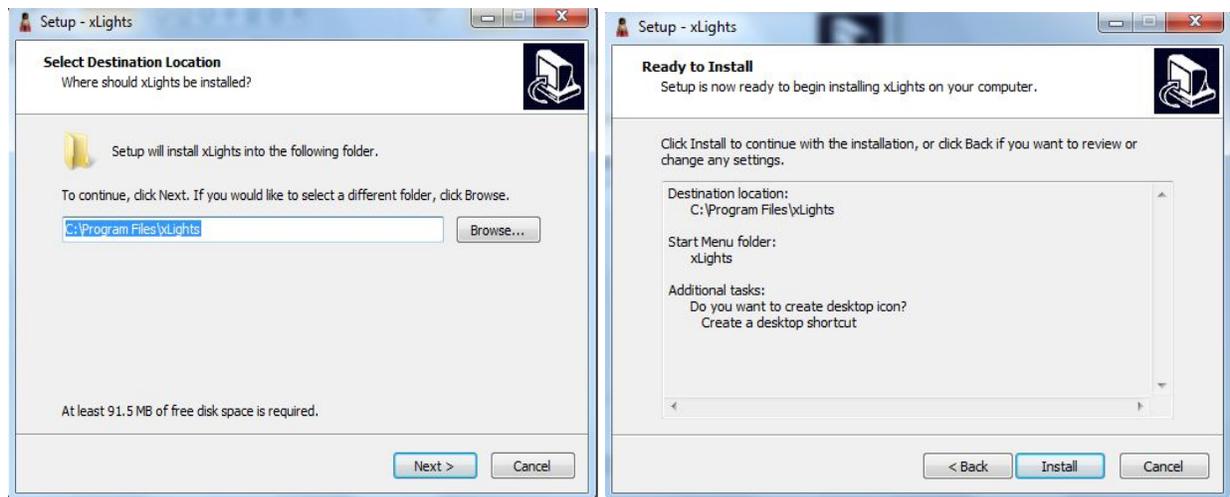
Testing



## Getting Started

This section describes the steps required to install and use xLights for the first time to create a sequence. The details of each step are covered in the respective sections covering that functionality. The examples use a Windows operating system but the process would be similar for Macintosh OSX, though the installation screens will look a bit different.

1. If you already have Audacity running on your computer, then it is likely that you would have also installed the Queen Mary VAMP plugins which are used by xLights. Otherwise, it is recommended that you install those plugins as described in the Installation section. You can however proceed without installing them and install them later.
2. Download and install xLights, selecting the defaults.

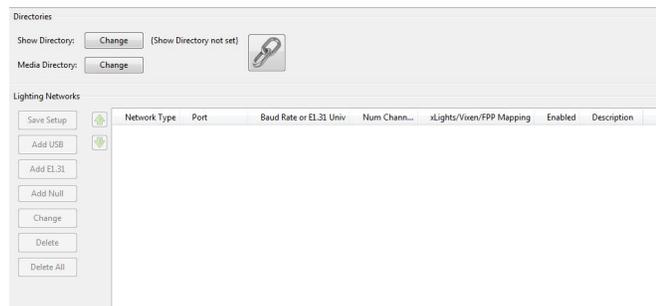


Installation options are further described in Chapter Three: Installation.

### Defining the Show and Media Directories

When the installation has completed, depending on your option selected, xLights will automatically launch or you can double click on the xLights icon/program to launch it.

You should be presented with the following screen:



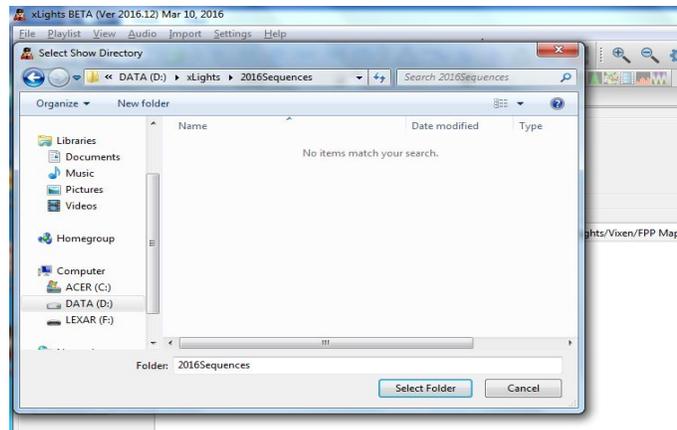
If this is the first time that you have installed xLights on the computer, then you need to define the show and media directories. Click on the Change button to select your show directory. The show directory is the location where your xLights xml files and your sequences will be created.



You will be presented with a screen to navigate to and select the directory folder. You can also create a new folder and then select it.

**Tip:** If you have not created a separate folder as yet, then it is recommended that you do so, so that all your xLights user files are in one place and can be easily transported or backed up.

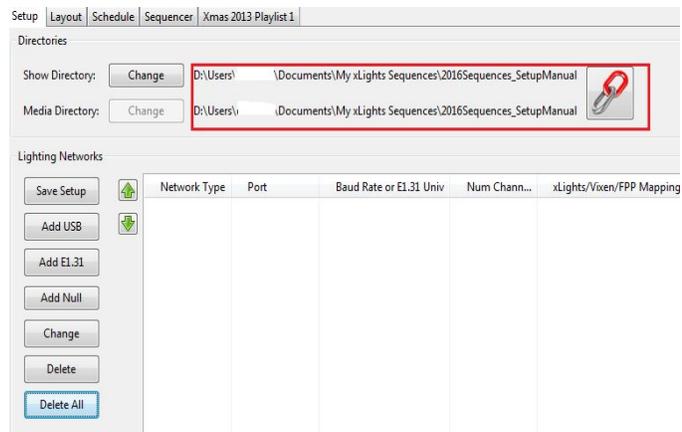
The next step is to select the location of your media files (mp3, mp4 etc). You can keep your media in a separate folder or use the same folder for both. Most people use the same folder.



To use the same folder for both, click on the Link icon .

xLights will then set the media directory/folder to be the same as the show directory. When the link is red, the folders are linked.

To select a different media folder, click on the Change button next to Media Directory label and follow the same procedure. You may have to click on the Lock icon to enable the Change button.



## Network definition

The network definition section defines the Universes that you will use and the channels within each universe. It is only used when outputting data to the controllers and can easily be changed at any time.

You do not have to define any network when you start, but you will need it defined before you can test any effects on physical lights from within xLights.

If you do want to define the network details at this stage, select the Setup tab and define a default network. The actual network does not have to be correct as you can change the details later without impact to other components.

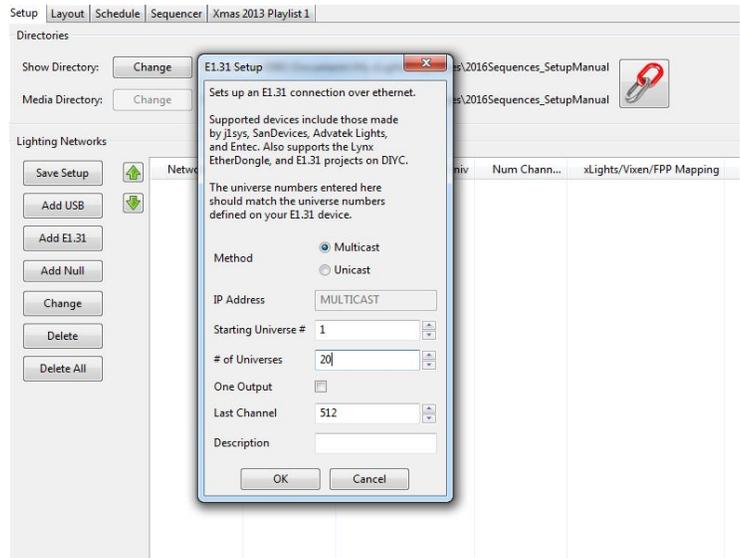
You can click Add Null and define a block of say 10,000 channels to work with (ensure that this is larger than what you will have in all your models) or you can define them as E1.31 which is the most common type.



Click on the Add E131 button:

Select Multicast,  
Starting Universe # = 1,  
#of Universes = 20,  
Last Channel = 512,  
and press OK.

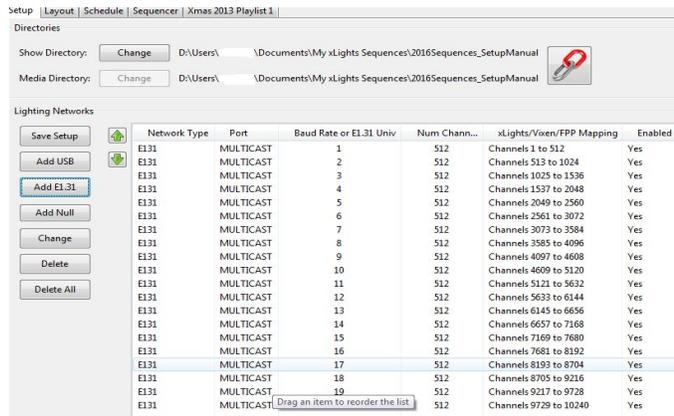
The Description attribute can be left blank at this stage.



This will create 20 universes, each of 512 channels starting from Universe 1 to Universe 20.

The start and end channels are automatically calculated and displayed in the last column.

Click on Save Setup to save the network created.



### Layout and Background Image definition

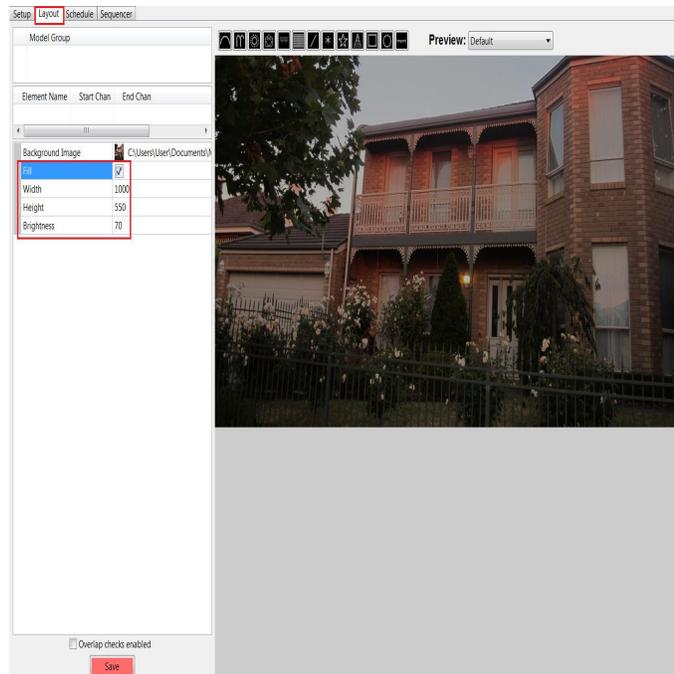
The next step is to add a Background Image for your House Preview Layout.

Click on the Layout tab. You will be presented with the list of Model definitions on the left (currently empty) and the House preview (shows up as black as no picture has been loaded).

You can proceed without a picture of your house/yard and add this in later.

Or you can select an image from any location. Click on the Background Image prompt and browse to and select your image.

The resolution of the image depends on the screen resolution and size of your display, but it





is possible to adjust this to fit your display. Use an image approx 1000 \* 550 as a starting guide.

Change the Width and Height attributes until you are happy with the image coverage. You can also adjust the Brightness value to 'dim' the light appearance.

Note that the image background, size and appearance does not drive any xLights functionality, but is more for the user to have a visual representation of where his or her models are and what they look like on the canvas.

Click on Save to set the image details.

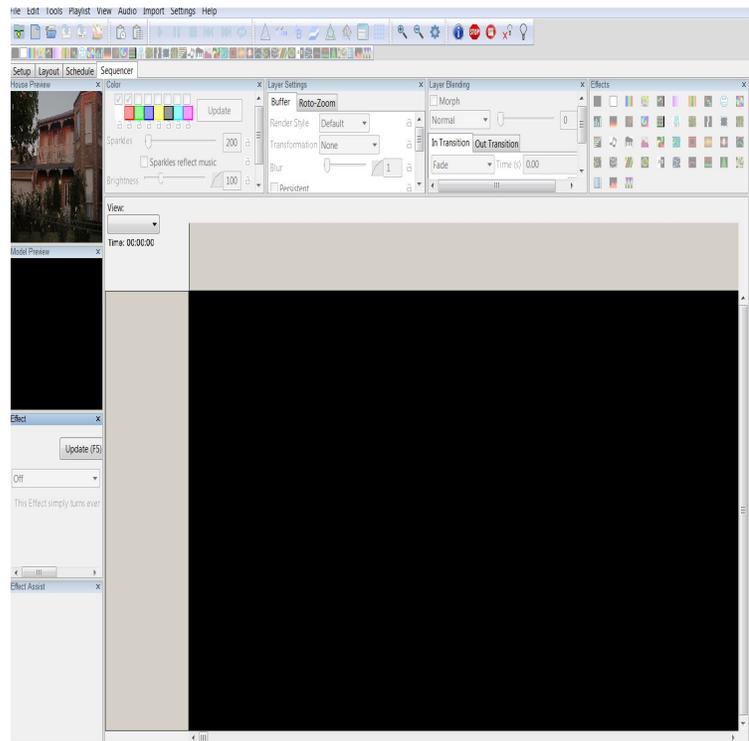
## Window Definition

Click on the sequencer tab.

The following window will be displayed.

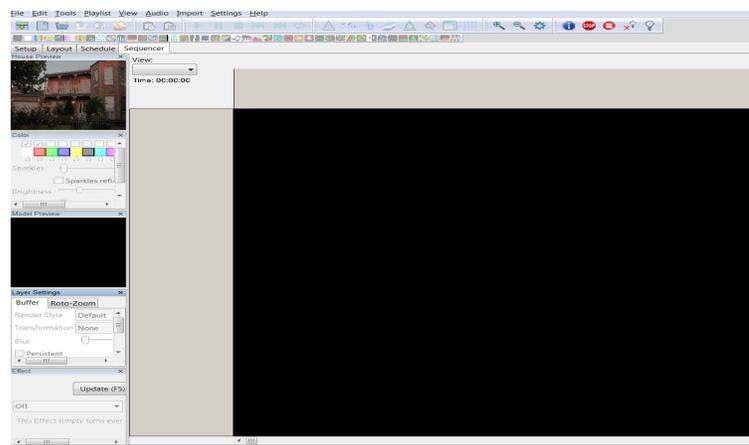
There a number of windows on the left of the Sequencer Canvas (Model Preview, House Preview, Effect Assist, Effect Settings) and on the top of the Canvas (Effects, Color, Layer Blending and Layer Settings). This is currently the Default Perspective.

If you have a single monitor, you can close the windows that you may not use straight away or if you have multiple displays , then you can drag and rearrange them.



The next image shows the common windows kept open, moved to the left, and the less common ones have been closed.

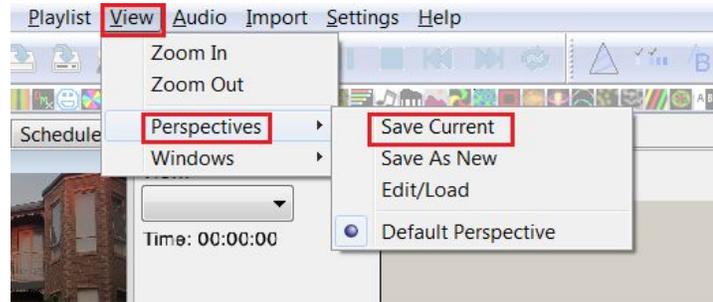
You can however arrange the windows in any fashion.





The rearranged windows must be saved as the default perspective so that it is loaded in that fashion whenever you open xLights.

Click on View, Perspective and then Save Current.



**Tip:** To Open and select Windows, click on View, Windows and select the Window(s) that you wish to have open.

### Model Definition

In this section, we will define a Model, a Model Group and add the model to the Model Group. Model and Model Group definitions are persistent, are to be defined once and can then be used in all your sequences.

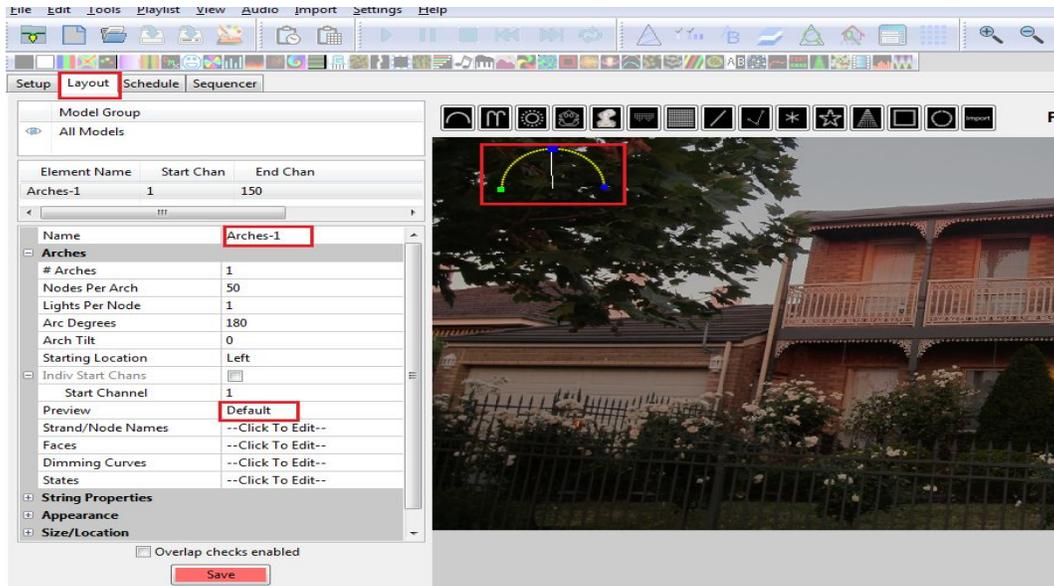
As an example, I am creating an Arch model and will call it 'Arch 1'. The arch is about 2.5 metres long and as such is made up of 25 RGB pixels.

Click on the Layout tab, then click on the Arches icon. The selected icon will have a blue square around it.



Then click anywhere on the Canvas and drag slightly. An image of an arch will be displayed and an Arch model called 'Arches-1' (the default name that is assigned to the model may be slightly different) will be created with a default set of attribute values.

The start channel is 1. (You can change this later). Change the Model name to 'Arch1' or 'Arch 1' or anything of your choice. Update the Nodes Per Arch value to 25. The end channel (75) will be calculated by xLights. If you are adding a second model, ensure that the start and end channels do not overlap with other models.

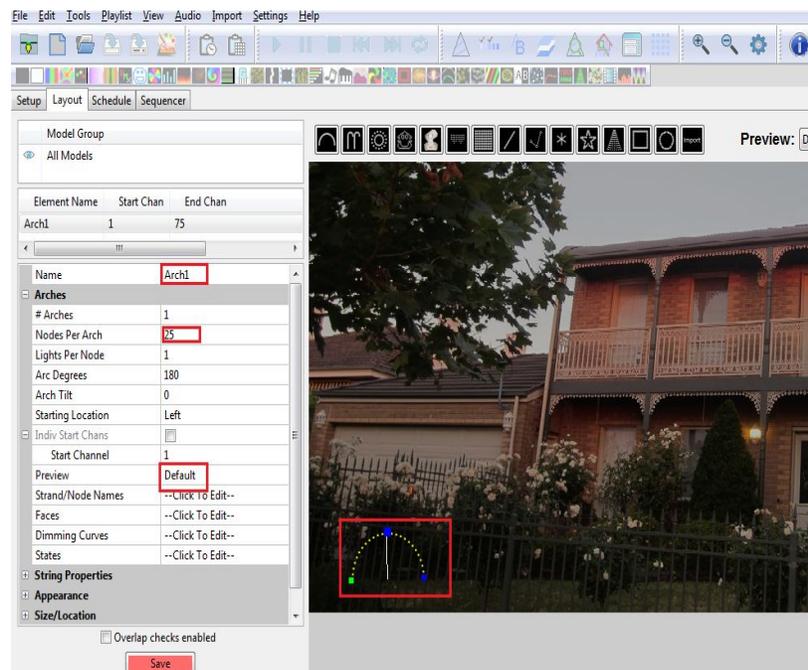


**Tip:** You can change the model name or any attribute by typing over/editing the attribute. For some attributes, click in the attribute window, to the right of the attribute name.

The Preview defaults to 'default' so that it will appear on the (default) House preview window.

Use the blue dots round the image to shrink it, rotate it if required and move it to the desired location. The green dot indicates the start of the model and the blue dot (right bottom) indicates the end of the model. When it is aligned horizontally, a red line is displayed between the green and blue dots.

The Arch1 image has now been moved to the bottom left location against the fence and has been reduced in size. Click on the Save button (just below the Models button) to save the work that you have done so far. This includes the Model definition and its position on the Layout.





## Model Group Definition

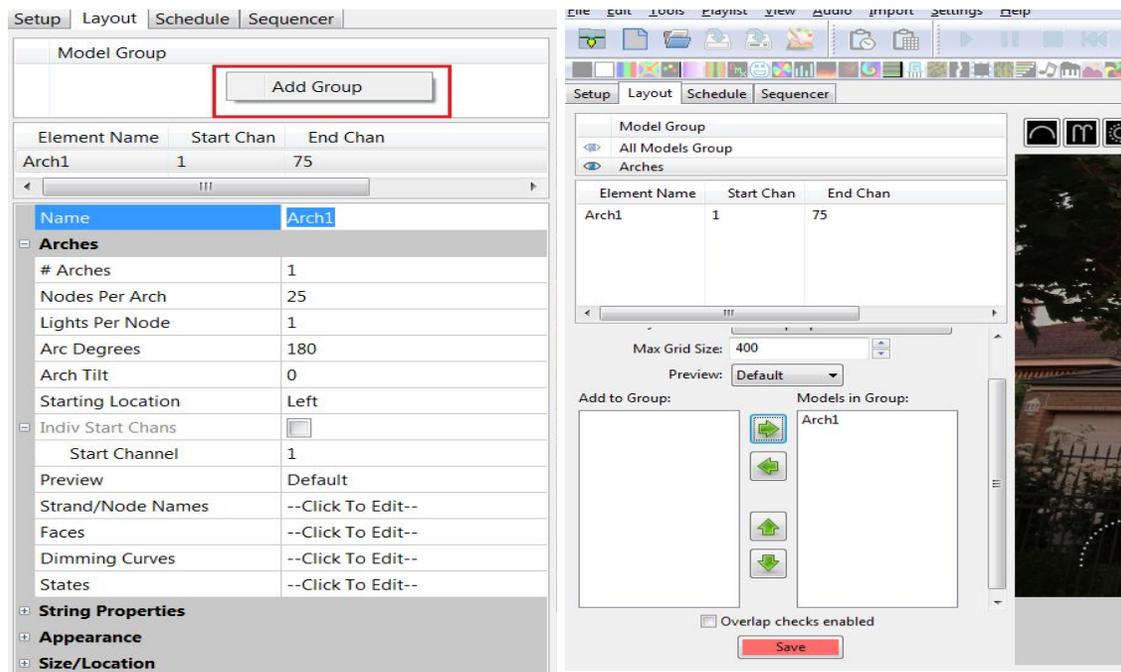
The next step is to define a Model Group. You can work without using model groups. You can also do this at any time later, but it is good practice and most useful later to have each model part of a group.

Right Click in the Models Group panel. An 'Add Group' button will be displayed.

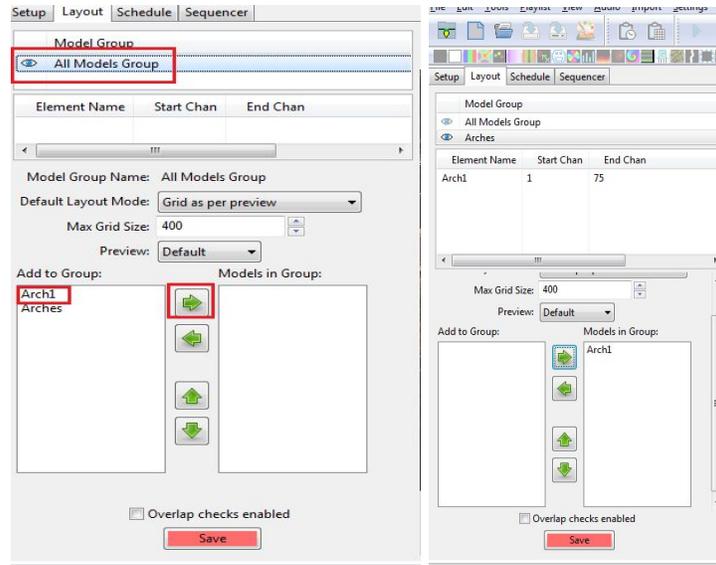
Click on the Add Group button. Enter a Model Group Name when prompted. I have called it 'All Models Group'. Every time I add a model, I will add it to this Model Group. A model can be part of more than one model group.

Next add the models that are part of the Model Group to the group. From the list of models, select the model and click on the right arrow to add to the model group window.

The model 'Arch1' is now part of the 'All Models Group' group. Click on Ok when complete



Repeat the above steps and add a second Model Group 'Arches Group'. Click on OK and then click on Save.

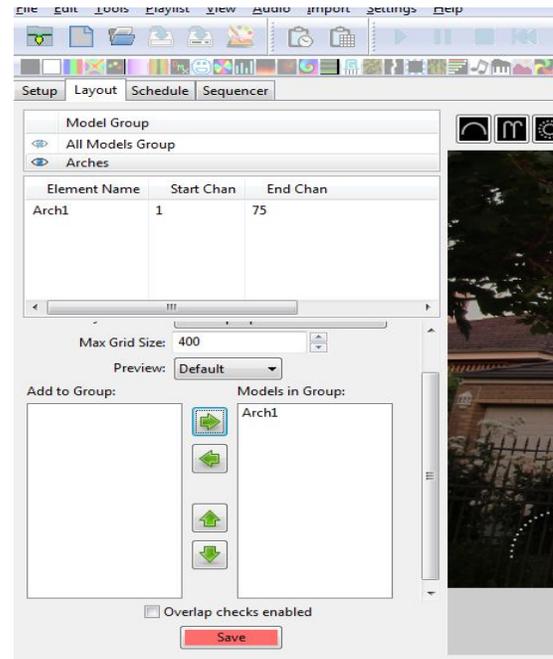


Select the Model group 'Arches Group' and adding the model 'Arch1' to that group too.

Click on Save to save the Model group updates (and all changes to the layout, models or model groups since the last time this save button was clicked on).

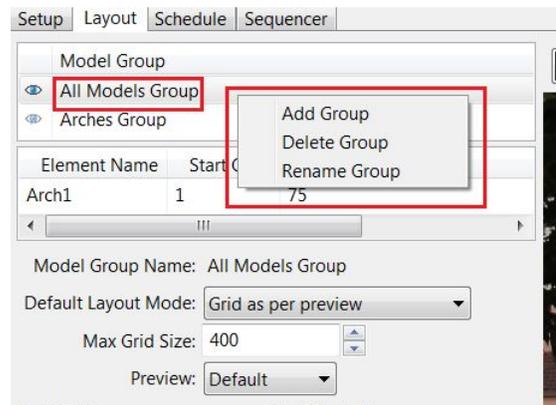
This completes a definition of a single model 'Arch1' that is an 'Arches' type of model, is part of a Model Groups 'All Models' and 'Arches Group', that is to be displayed on the Layout display. The model image has been resized and placed against the fence in the layout.

Should you wish to Rename a Model group or delete it, highlight the Model group Name and right click. Use the resulting window to rename or delete the group.



You can also add additional groups.

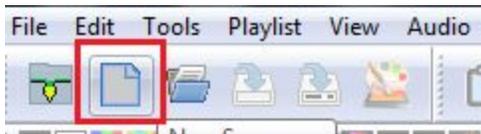
The next step is to create a new sequence.



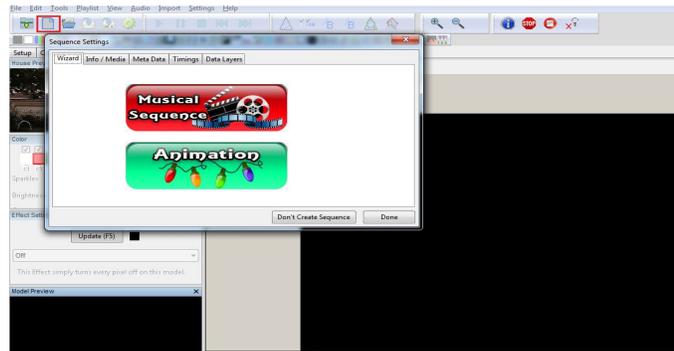


## Creating a New Sequence

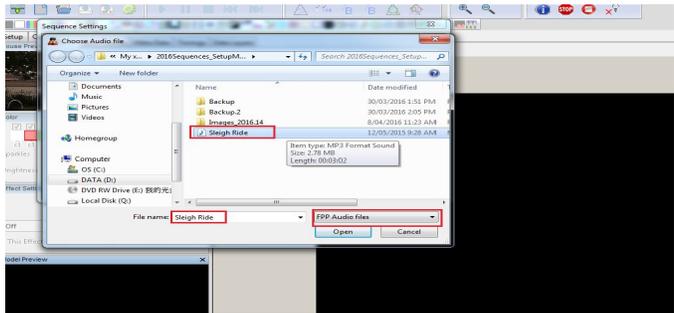
Click on the New Sequence icon



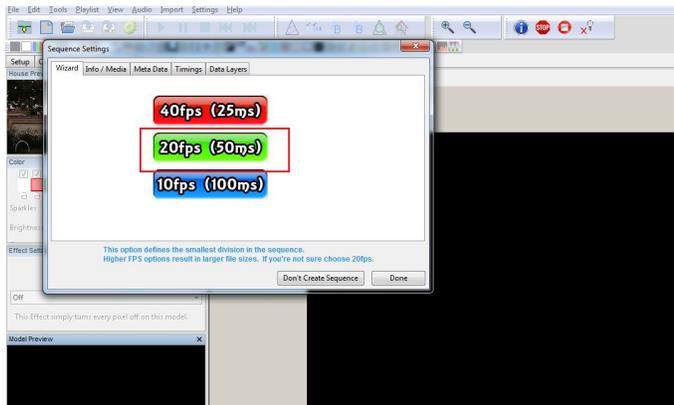
and from the following screen, select Musical Sequence.



Select the media file for the audio.



Select the frames per second (FPS) - 50ms is the most commonly used one.



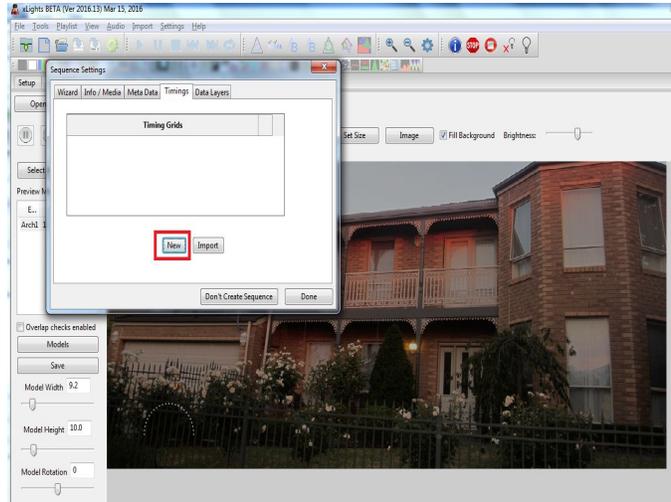
On the next screen, you can click on Quick Start and create timing marks later or you can create timing marks now by clicking on the Timings tabs.

If you forget to do it at this stage and move on to the next screen, you can always create timing marks later by accessing the Timing menu via the Settings menu.

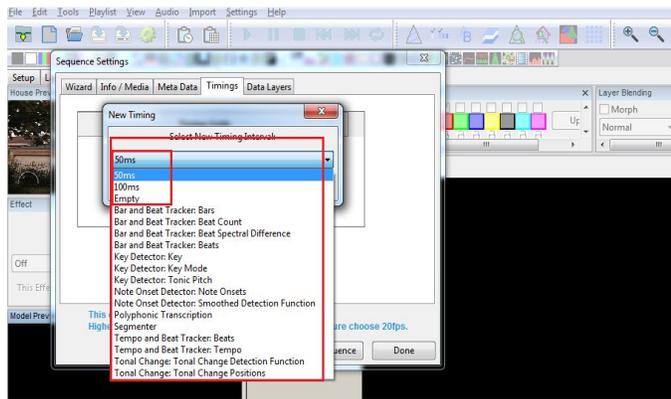




Click on New to create a new Timing Marks Grid.



If the QM Vamp plugins have not been installed, then you will be presented with the following options only. In which case select 50 ms and continue. You can add new or additional Timing Mark intervals at any time later.

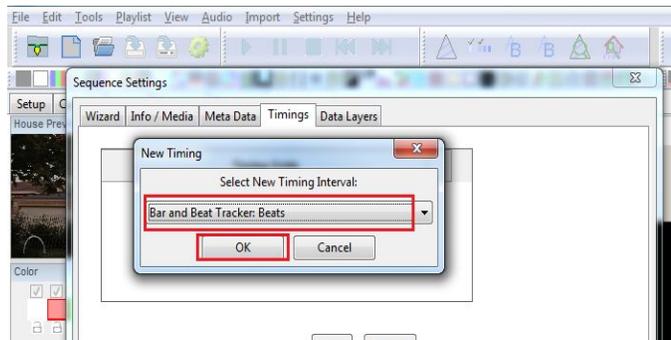


If the QM Vamp plugins have been (correctly) installed, then you will be presented with a number of different options.

You can also add new or additional Timing Mark grids at any time later.

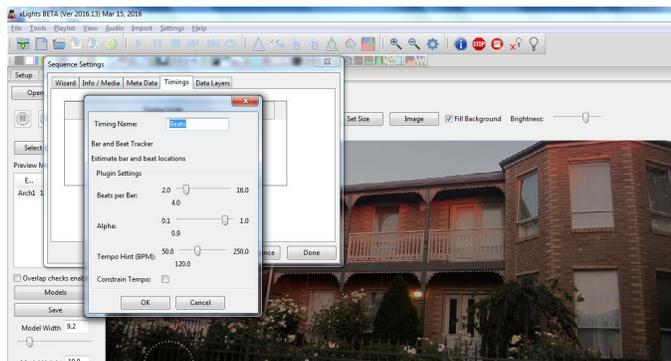
Select the Beats Timing Interval.

(You can select any one - but this is one of the common timing marks used).



Then Click Ok.

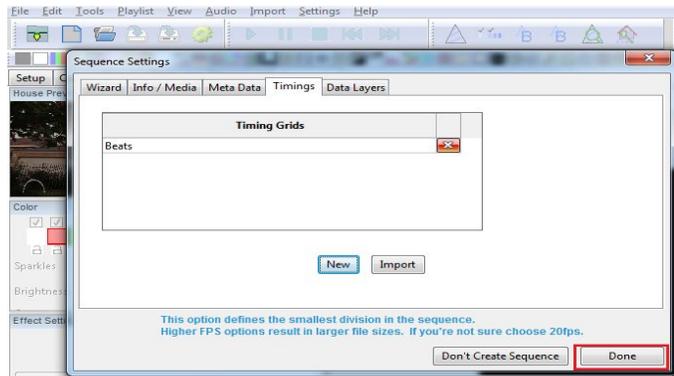
Leave the default values on this screen and click Ok.





You can click on 'New' again to add an additional timing mark if you wish or click on Done to move on to the next step.

(This example clicks on Done).

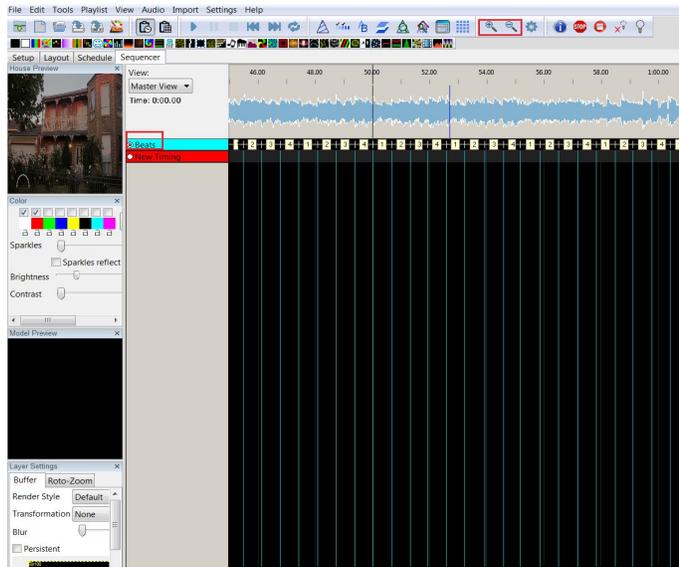


### Adding Models to a View

If you not already on the Sequencer tab, then click on the Sequencer tab. The timing mark grids that you have created will be displayed on the left side of the sequencer canvas.

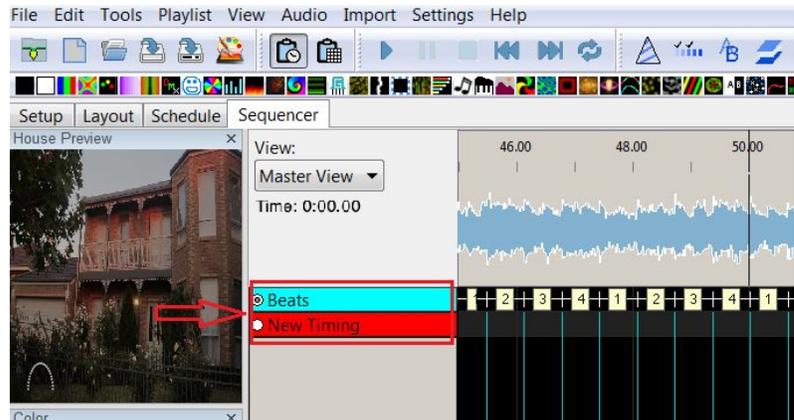
Ensure that the 'Beats' timing grid is selected. Use the zoom buttons to zoom out or in.

The next step is to add the required models to a View so that the models are then available to place effects against. Each sequence has a 'Master View' that is automatically created. The Master View defines a list of models that are specific to that sequence only. For this example, we will use the Master View.



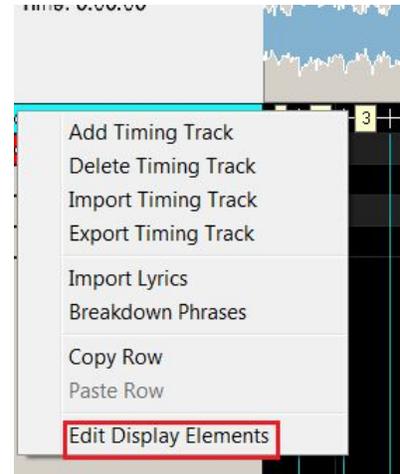
 **Tip:** It is worthwhile creating another View that contains all your models (or a common set of models) which can then be used in all your sequences so that they do not have to be added each time.

Right click on the Timing grid names (in the area highlighted on the screen).





Select the Edit Display Elements option from the pop up window.

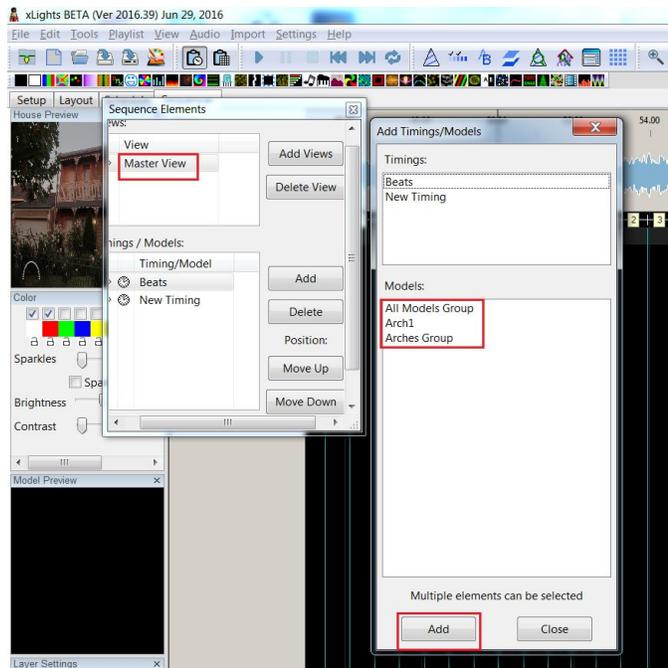


Select the Master View from the top window. Click on Add.

From the lower window select the Beats timing and Click on Add.

Or you can hold down the Ctrl key and select multiple items (Beats, All Models and Arches Group) and then click on Add.

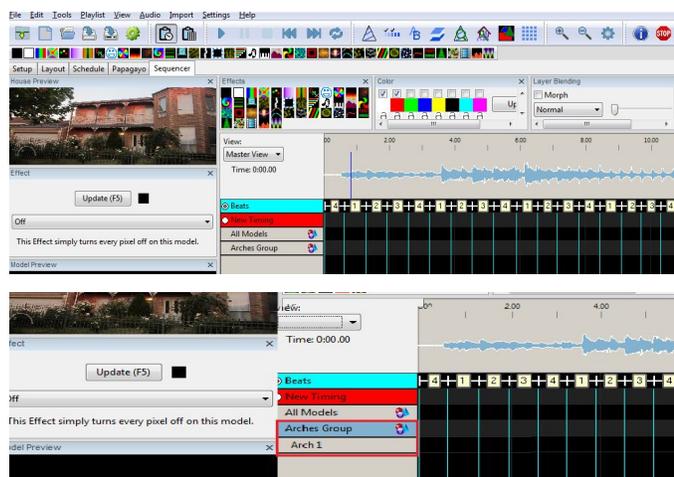
Click on Close when done.



Back on the Sequencer tab, select Master View as the view to be used if this is not defaulted in. The 'Beats' timing mark, the 'All Models' and the 'Arches Group' model groups (which were defined as part of the Master View in the previous two steps) are then displayed.

Model groups are identified by a small group icon after the name.

If you double Click on the Model Group name, it will expand and show you the models that have been defined as part of the Model group - in this case the 'Arch 1' model.





You can then drop and effect against either the Model Group or the Model. Double Click again to collapse the Model Group.

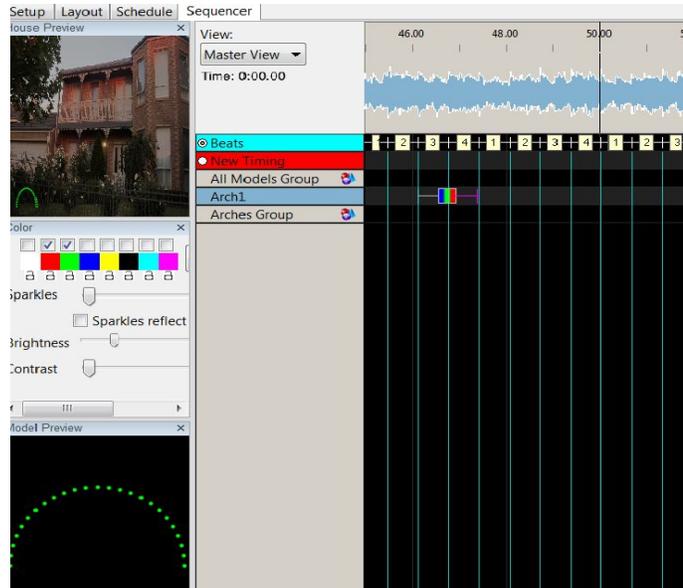
### Adding Effects Against a Model

Select an effect (in this case the Bars effect) and drag it onto the grid in line with the 'Arch 1' model.

This is effectively placing the effect against the model.

You could also place it against the Model Group - (one line higher), in which case it applies to all models under the Group.

You can grab the edge (in purple) and drag it to the right to stretch. Note that the effect shows in the Model window and in the House Preview window.

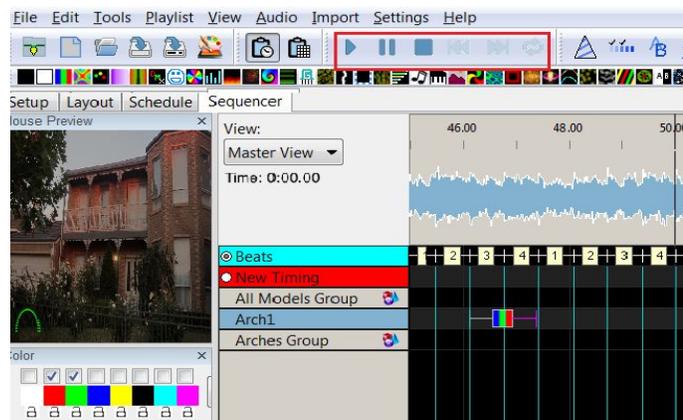


You can change attributes via the Effects Setup Window. For example, change from 'Rainbow' to 'Palette'. This window can be dragged out to a another location and expanded. The windows will resize.

You can change the color of the effect, by selecting a different set of colors from the Color window.

Use the highlighted keys to start, stop pause, rewind and play again. As the sequence plays, you can see the effects on the House Preview screen.

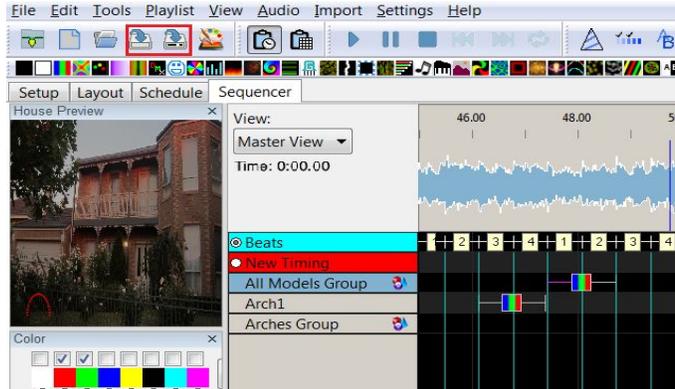
Select the Bars effect and drop it on the sequencer grid against the 'Arches' Model Group. Play the sequence and observe the effect in the Model Preview window and House Preview windows.





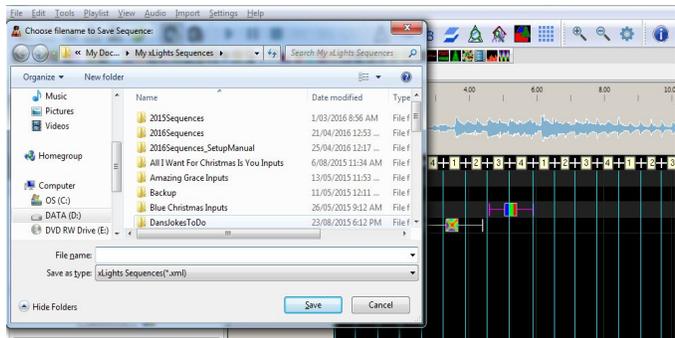
## Saving the Sequence

Click on the Save or Save As icon to save the sequence.



Since this is the first time that the sequence is being saved, the Save As dialogue box opens for a file name to be provided.

Provide a name and then click Save.



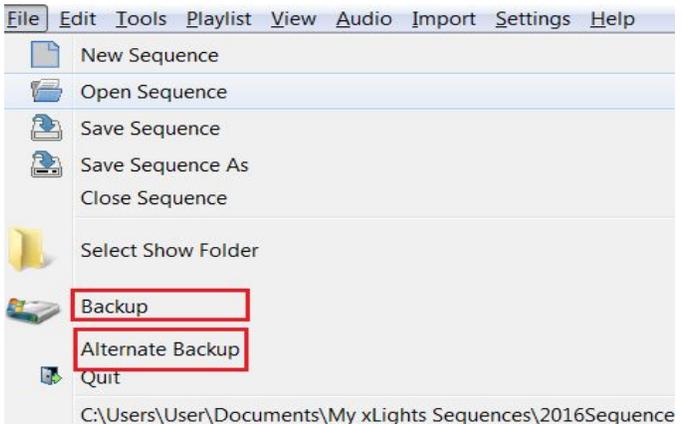
## Backup and Exit

Click on the File Menu.

The drop down list has options to backup files, close the sequence and Quit xLights.

Click on the Backup option (or press F10). The backup process will copy all xml files (including key xLights setup and the model definition from your show directory only.

You can also click on Alternate Backup or press F11 to backup to a different location.



**Note:** This will not back up any images, pictures or media files.

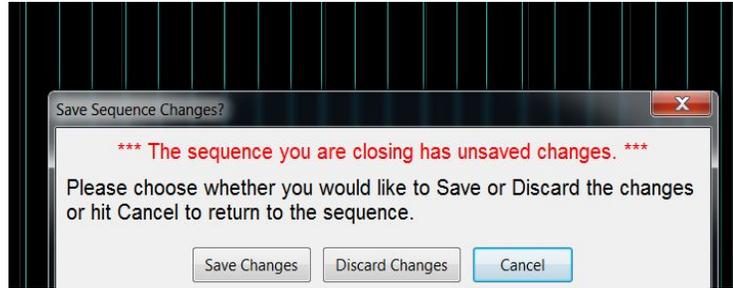
A message is displayed indicating the name and location of the backup files.

Select Yes to accept. Then, from the file menu again, click on Close Sequence.

Then click on Quit.



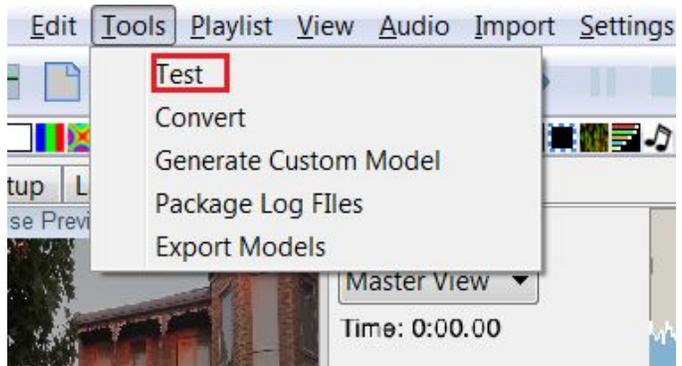
If the following message is displayed, xLights has detected that there has been a change to the Model or View definitions that has yet to be saved.



Click on 'Save Changes' to save.

### Testing

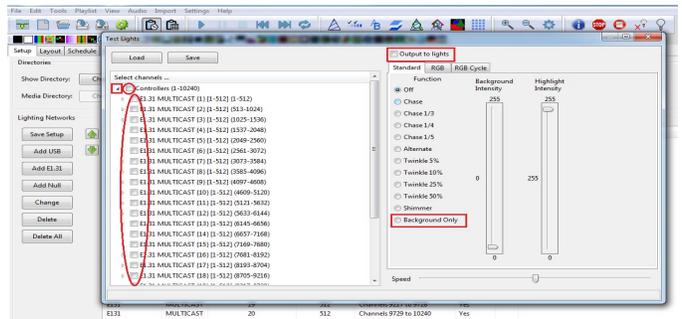
If you have a set of lights connected to your controller, you can test them directly via xLights. Open the previously saved sequence if it is not already open.



Ensure that the channels and universes configured on your controller match your xLights definition. As an example define 512 channels on Universe 1 and connect a string of lights to that output.

Then select the Test option from the Tools menu.

You will be presented with a screen that shows the controller and all the channels configured via the Setup Tab.



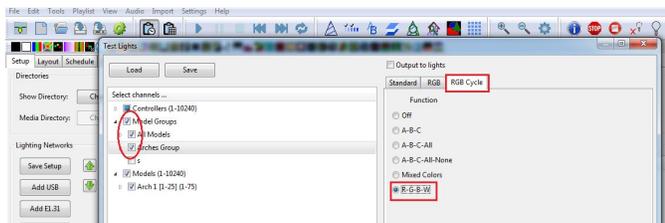
You can select the channels you want to test or in this case select the controller which then selects all channels.

Ensure that 'Output to Lights' is selected.

Select the test function (example Background Only) and use the sliders to increase the intensity.

To display Model groups or Models instead, click on the small arrow at the top left (highlighted).

Different test functions are available for RGB, non RGB lights as well as the option to execute different test cycles. You can also select and change background as well as highlight colors and control the speed of the function using the controls provided.



Click on background only and move the sliders up or click on RGB lights and select RGBW. At the end of testing, unselect the 'Output to Lights' or click on the Lights Off button. The yellow bulb will turn off.



## Chapter Three: Installation

### Downloading xLights

Windows  
Macintosh  
Linux

### Installing

Windows  
Macintosh  
Linux



## Downloading xLights

### Windows

The latest release of xLights for Windows can be found at the following link: <http://nutcracker123.com/nutcracker/releases/>. This page also has links to other commonly used software.

### Macintosh

The latest release of xLights for Macintosh can be found at the following link: <http://www.dankulp.com/xlights/?C=M;O=D>

### Linux

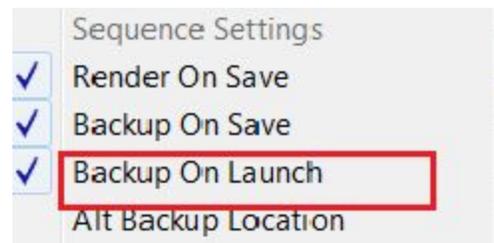
The latest release of xLights for Ubuntu Linux can be found at the following link: <https://code.launchpad.net/~chris-debenham/+archive/ubuntu/xlights>. For other Linux distributions you will need to download the source from <https://github.com/smeighan/xLights> and compile as per the included README.linux file.

## Installing

If this is an upgrade to an existing xLights setup, make sure that you backup your existing files before installing a new version. The install process does not delete any of the files required for your sequences or setup, as these files are kept in the show and media directories. To backup your existing files, follow the procedure described in Chapter 5: Menus or just press F10.



**Caution:** Before you install any new release of the software, it is very good practice to backup your key xLights files. This can be set to automatically by enabling the 'Backup on Launch' option via the Settings tab. Alternatively you can manually do so via the F10 or F11 functions.

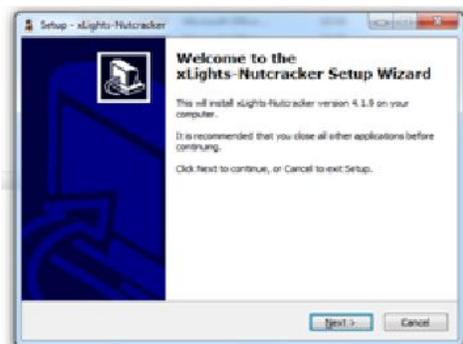


If you have any sequence currently open, then changes to the effects, views, models etc may not have been saved until you exit xLights.

Please also refer to the Backup section in this document which describes how xLights handles current unsaved work.

### Windows

1. Download the required released executable file and save to any location on your Windows PC.
2. Double click on the downloaded executable.
3. The xLights setup Window will be displayed.
4. Click on Next.
5. Select the destination location. Leave as is to upgrade to a new release. Follow the prompts and click on install when ready.
6. Click on Finish to complete the installation





The xLights software will be installed in the destination location. In addition to the software required to run the application, the installer also installs a few useful utilities, dictionaries and a songs subdirectory. The xLights application software (32 bit) is installed by default in the xLights subdirectory within your Windows Program Files directory ( C:\Program Files\xLights\ ) or ( C:\Program Files (x86)\xLights\ for Windows 64 bit).

The location can be modified during the software install process by the user.



**Tip:** When xlights is installed, some browsers/virus scanners may flag the file and either prevent download or require you to provide extra assurances that you really want to download the file.

If you do not have Audacity installed on your computer, then you should at least install the Queen Mary Vamp plugins for Audacity.

For the QM vamp plugin packages that can be installed without Audacity installed, first download the plugin package (zip file for Windows) from the following address: <http://isophonics.net/QMVampPlugins> and install on your computer.

### Macintosh

.tar option:

1. Double click on the compressed file that you downloaded.
2. Drag the newly created folder containing the xLights application and associated files to the location of your choice. The xLights application software folder is created in the same directory as the downloaded file.

.dmg option:

1. Double click on the compressed disk image to mount the disk.
2. Copy the xLights application to your location of choice.



For the QM vamp plugin packages that can be installed without Audacity installed, first download the plugin package from the following address: <http://isophonics.net/QMVampPlugins>

To install, copy the files:

```
qm-vamp-plugins.dylib
qm-vamp-plugins.cat
qm-vamp-plugins.n3
```

to one of the following locations on your computer

```
/Library/Audio/Plug-Ins/Vamp/      (for plugins to be available to all users)
$HOME/Library/Audio/Plug-Ins/Vamp/ (for plugins to be available to you only)
```



### Linux/Ubuntu

1. Add the xLights package archive by running "sudo add-apt-repository ppa:chris-debenham/xlights" in a terminal window.
2. Update the list of available packages and then install xlights by then running "sudo apt-get update" and "sudo apt-get install xlights".
3. To enable automatic timing markers you will need to install the Queen Mary Vamp plugins. They can be downloaded from <http://isophonics.net/QMVampPlugins>. Once downloaded extract the plugins and copy the files qm-vamp-plugins.so, [qm-vamp-plugins.cat](#) and qm-vamp-plugins.n3 to either \$HOME/vamp/ or /usr/lib/vamp/



## Chapter Four: Setup Tab

### Setup

#### Directories

*Show Directory*

*Median Directory*

#### Lighting Networks

*Add USB*

*Add E1.31*

*Add NULL*

*Change, delete or*

*delete all*

*Save Setup*

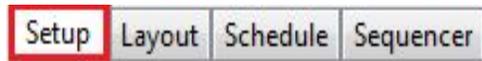
*FFP Setup*

*End to End*

*Examples*

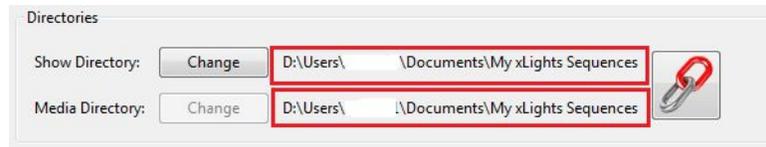


## Setup



The Setup tab is used to define the locations of the Show and Media directories as well as to configure the details of your network for each Universe.

### Directories



#### *Show Directory*

The xLights Show Directory is where all the required xLights sequences, pictures, and user configuration files required to run the sequences are kept. When a sequence (.xml) is saved and a binary file (.fseq) rendered, both files are created in the show directory. This is the same location where xLights configuration files can be found and the default location where the program will first prompt for, or look for files pertaining to several functions of xLights.

#### *Media Directory*

The xLights Media Directory is where the required audio (.mp3 or mp4) and video (.mp4) media files are kept. The media directory can be different to the show directory or can be the same directory. This is the default location where xLights will first prompt for, or look for media files when creating a new musical sequence. The user can however, browse to and select a media file from another location. After which, the media location and name is as specified, and is saved in the sequence xml file. If while opening the sequence, the media file cannot be located as specified in the sequence xml, xLights will look for a file of the same name and type in the media directory.

Specifying the names of these directories or changing them can be done by clicking on the Change button found on the Setup tab screen. If the two directories have been linked together (via the link icon), then the user can only change the location of the Show Directory and the same change will apply to the Media Directory.



(linked icon)      (unlinked icon)

If separate locations are required, click on the icon to unlink the directories, at which point you can change the location of either directory.



**Tip:** Users often have a common media directory for all shows. However, a more common practise is to place all of the media for a particular show event in the show directory and set both of them to be the same. It makes it much easier to back it up, copy it between computers etc.



**Tip:** It is useful to have separate show directories for each major event i.e. one for Halloween, one for Christmas or one for the next year. Start a new year directory by copying sequences from the Show Directory of the previous year.



**Tip:** Keep the folder containing your `xlights_rgbeffects.xml` file the same and create folders in directories at higher levels and xlights will automatic adjust file paths. As an example, use 2015/Christmas and 2016/Christmas (the last sub folder folder is the same) instead of Christmas/2015 and Christmas/2016.



**Caution:** Images used for pictures and faces use an absolute location reference. If you are not using the suggested structure, then the location won't be found if you change your show directory.

In some cases if you copy your show directory to another location or drive xLights may still be able to successfully locate image files despite the absolute reference (in the case where the the last sub folder of the location has the same name).

If you have a show folder `c:\show` and you move it to `e:\xxx\yyy\show` it will seamlessly work as long as all the files your sequence needs are in the show folder or one of its subdirectories. Anything located elsewhere will not be seamlessly moved but if they are still there they will be used.

This is useful if you are moving your setup to a USB drive or Dropbox. If however you move it to `c:\show_old` and try to set that as the show directory, then the files wont be referenced.

## Lighting Networks

Each Universe (or section of Universe) should be defined, ensuring that the start and number of channels match your models.

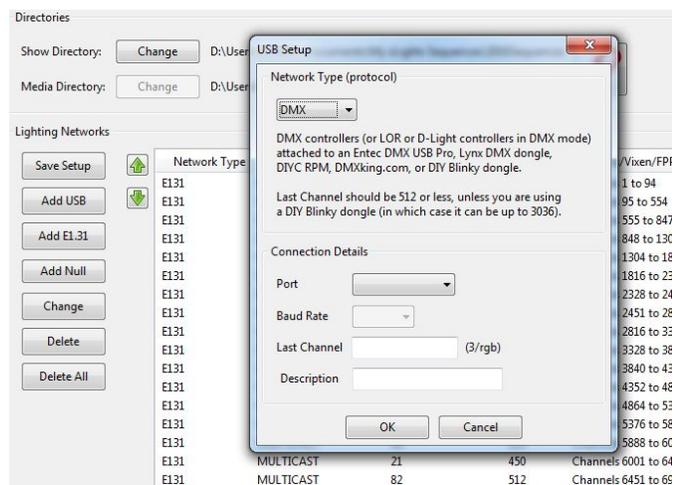


**Tip:** As described under [Chapter Two: Quick Start Guide](#), you can start with a default set of configuration values and then come back to change or update the details before testing your lights physical output. Or you can chose to not define any network information at the beginning until you wish to test from within xLights.

### Add USB

This option is to be used to define a DMX, Pixelnet, LOR dongle, D-Light, Renard or OpenDMX setup.

Each USB choice is described in the text found below the drop-down selection. As you select a different choice, the text assists you in identifying the best choice for your USB dongle.

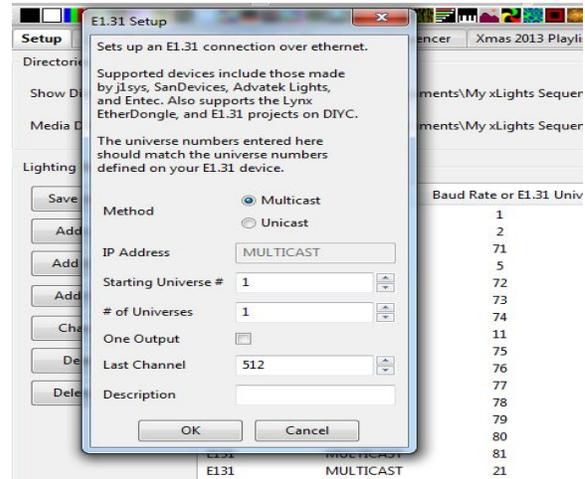




### Add E1.31

Clicking on the Add E1.31 button will display the following screen:

Select the Method (Multicast or Unicast) depending on which option you will use to drive your lighting networks. If unsure, leave as Multicast. If Unicast is selected, then the IP address of the controller that will support the universe(s) you are defining here must be entered. Enter the Starting Universe #, # of Universes and the Last channel for each universe. Leave the One Output unticked. The Description attribute is useful for annotating what the particular channel range is used for in your display.



**Note:** If the 'One Output' is ticked, then visually the universes and number of channels will be grouped as follows:

E131	MULTICAST	92-94	512x3	Channels 29088 to 30623	Yes
------	-----------	-------	-------	-------------------------	-----

This way of defining the universes is useful when you have a large group such as P10 panels which cover a number of universes.

The "Enable" value turns on/off that output when "Output to lights" is turned on. If it's not enabled, no output occurs. For example, if you have a controller not plugged in (testing a different controller) disabling that output would not attempt to send anything to that specific controller. Trying to send data to a controller that is not connected and in some cases cause delays and lags on the output.

Highlight the row and Double Click on it to toggle the value.



**Tip:** Most controllers only support 510 channels per DMX universe. The Falcon F16v2 controller supports up to 512 channels per universe. If configuring universes for a matrix that will be used on P10 panels, those universes should be defined as 512 channels per universe.



**Tip:** If you have a number of contiguous universes of a fixed number of channels you can enter the starting Universe #, a multiple of Universes and the Last Channel (number of channels), click OK and xLights will create the universes for you. You can then modify the details after that. Alternatively, define each Universe by specifying the Universe # in the Starting Universe # field, set the # of Universes to 1 and set the Last Channel to the number of channels in that section of the Universe.

Press OK.



**Tip:** When you save your setup, xlights also creates a 'universes' file which can be placed in the media folder on the Pi. This saves you having to enter all the controller config again.

The following picture shows a configuration where:

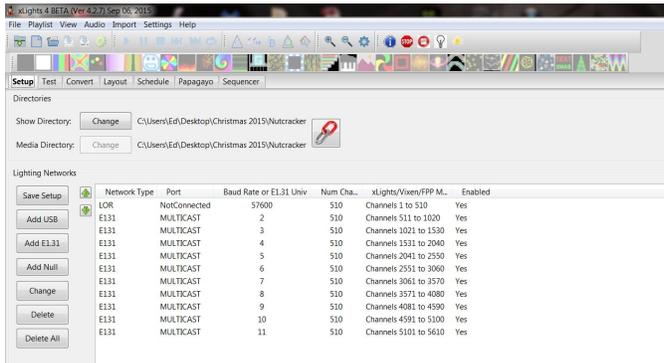
- Universe 1 has 94 channels from Channel number 1 to 94
- Universe 2 then has 460 channels from Channel number 95 to 554
- Universe 71 has 293 channels from Channel number 557 to 847
- Universe 5 then has 456 channels from Channel number 848 to 1303 etc.



Network Type	Port	Baud Rate or E1.31 Univ	Num Chann...	xLights/Vixen/FPP Mapping	Enabled	Description
E131	MULTICAST	1	94	Channels 1 to 94	Yes	DMX-Cane,Icicle, RobTree,Singing Face
E131	MULTICAST	2	460	Channels 95 to 554	No	Outline-A1,A2,A3,A4,A5
E131	MULTICAST	71	293	Channels 555 to 847	Yes	Unused
E131	MULTICAST	5	456	Channels 848 to 1303	Yes	Outline-B1,B2,B3,B4,B5
E131	MULTICAST	72	512	Channels 1304 to 1815	Yes	
E131	MULTICAST	73	512	Channels 1816 to 2327	Yes	
E131	MULTICAST	74	123	Channels 2328 to 2450	Yes	



**Note:** If there are gaps in between, it is not required to specify the missing channels.



This image describes a setup where a LOR network has been listed first. Even though only the first 32 channels of the LOR network are used, universe 1 has been defined as 510 channels in case more items are to be added to the LOR network without impacting the other channels above.

If universe 1 is set to 32 channels, then Universe 2 will start from 33 onwards - that is also a valid configuration.

### Add NULL

This type of setup is used as an example, where the sequence output will not be used by xLights as a show player, but output data to be used for playback on a Raspberry Pi or BeagleBone Black controller.

There could be large matrices to be implemented via P10 or P5 panels running off a BeagleBone Black controller. A null output can reserve a huge number of channels, but not actually output anything if the Output to Lights function is on. A model can still be sequenced as normal and viewed on all the windows just as any other output.

Click on Add Null and specify the number of channels to be reserved. The corresponding number of channels will be created.



**Note:** If the Falcon Player on the Raspberry Pi or BeagleBone Black controller is to be used in 'Bridge Mode' (for testing via the sequencer prior to your show) then the universes and corresponding channels must be defined i.e. a definition of NULL will not output any lights.

### Change, Delete or Delete All

To change or delete an individual row, highlight the row and select Change or Delete. Click on Delete All to delete the entire set up.

### Save Setup

Once you have your lighting network setup, clicking on Save Setup will save your configuration. If you forget to save, don't worry, you'll be prompted upon exiting xLights asking if you want to save your network setup.



*FPP Setup*

The following image describes how the same channel ranges and universes are defined on the Falcon Player (FFP).

The sequence is the Start Channel, the Universe number and the Number of Channels.

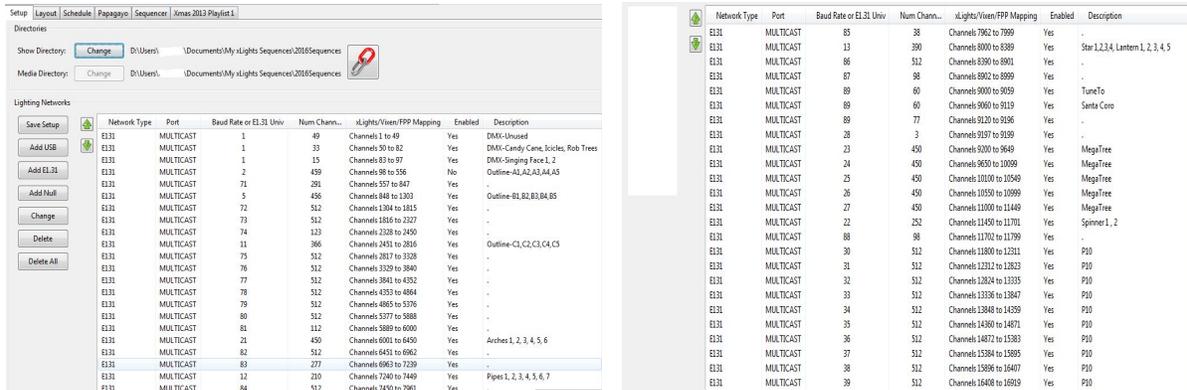


*End to End Setup examples*

The following setup example shows an FPP on a PI driving a Pixlite16 with Universes (23-27), a Jlsys P2 using Universe (21), the FPP configuration to support it and the xLights setup definition.

The Pixlite16 configuration has been duplicated on an Fl6V2 (as a test only) and has been included for reference.

xLights definition





Pixlite16 definition (snapshot)

Output	Start Universe	Start Channel	End Universe	End Channel	Mask Pixels	Null Pixels	Zig Zag	Group	Intensity Level (%)	Reversed
Output 1	89	1	89	50	20	0	0	1	100	
Output 2	23	1	23	150	50	0	0	1	100	
Output 3	23	151	23	300	50	0	0	1	100	
Output 4	23	301	23	450	50	0	0	1	100	
Output 5	24	1	24	150	50	0	0	1	100	
Output 6	24	151	24	300	50	0	0	1	100	
Output 7	24	301	24	450	50	0	0	1	100	
Output 8	25	1	25	150	50	0	0	1	100	
Output 9	25	151	25	300	50	0	0	1	100	
Output 10	25	301	25	450	50	0	0	1	100	
Output 11	26	1	26	150	50	0	0	1	100	
Output 12	26	151	26	300	50	0	0	1	100	
Output 13	26	301	26	450	50	0	0	1	100	
Output 14	27	1	27	150	50	0	0	1	100	

F16V2 definition (snapshot)

**E131 Setup**

Universe Count:

Addressing Mode:

#	Universe	Size
1	23	450
2	24	450
3	25	450
4	26	450
5	27	450
6	89	150

**Port Configuration**

Port #	Type	Universe	Start Chnl	Port Cut	Group Cut	End Univ	End Chnl	Direction	Order	Null	Zig Cut	Brightness
1)	WS2811	89	1	60	1	89	150	Forward	RGB	0	0	100%
2)	WS2811	23	1	50	1	23	150	Forward	RGB	0	0	100%
3)	WS2811	23	151	50	1	23	300	Forward	RGB	0	0	100%
4)	WS2811	23	301	50	1	23	450	Forward	RGB	0	0	100%
5)	WS2811	24	1	50	1	24	150	Forward	RGB	0	0	100%
6)	WS2811	24	151	50	1	24	300	Forward	RGB	0	0	100%
7)	WS2811	24	301	50	1	24	450	Forward	RGB	0	0	100%
8)	WS2811	25	1	50	1	25	150	Forward	RGB	0	0	100%
9)	WS2811	25	151	50	1	25	300	Forward	RGB	0	0	100%
10)	WS2811	25	301	50	1	25	450	Forward	RGB	0	0	100%
11)	WS2811	26	1	50	1	26	150	Forward	RGB	0	0	100%
12)	WS2811	26	151	50	1	26	300	Forward	RGB	0	0	100%
13)	WS2811	26	301	50	1	26	450	Forward	RGB	0	0	100%
14)	WS2811	27	1	50	1	27	150	Forward	RGB	0	0	100%

J1SYS2

ECG-P2

**Main Page**

**System Info**

**Statistics**

**String Stats**

**String Config**

**Effect Config**

**Strobe Config**

**IP Config**

**XML Config**

**Reboot Master**

This page allows the configuration of your attached strings.

**CAUTION:** These new settings should agree with the physical strings you have connected. The settings will not take effect until the unit's next reboot.

String Parameters:

#	Act	String Type	Speed Kbps	Univ	Start Slot	Pixel Count
#01	<input checked="" type="checkbox"/>	WS2811	3000	21	1	150
#02	<input type="checkbox"/>			4	1	1
#03	<input type="checkbox"/>			9	1	1
#04	<input type="checkbox"/>			5	1	152
#05	<input checked="" type="checkbox"/>	WS2811	3000	5	1	152
#06	<input type="checkbox"/>			6	1	1
#07	<input type="checkbox"/>			7	1	1
#08	<input type="checkbox"/>			8	1	1



*Intentionally left blank.*



## Chapter Four: Layout Tab

### Layout

#### Layout Views

*Default*

*All Models*

*An Individual Group*

#### Preview Layouts

#### Models

*Creating A New Models*

*Deleting Models*

*Undo*

#### Model Attributes

##### Basic Attributes

*Candy Cane*

*Circle*

*DMX*

*Icicles*

*Matrix*

*Single Line*

*PolyLine*

*Adding Segments*

*Segment Curves*

*Spinner Model*

*Star*

*Tree*

*Window Frame*

*Wreath*

*Individual Start Channels*

*Strand/Node Names*

*Display in Preview*

*In My Display*

*Dimming Curves*

*State*

*String Properties*

*Creating Multiple Model Instances*

*Appearance*

*Size/Location*

*Rename a Model*

*Modify a Model*

*Copy a Model*

*Node Layout*

*Export CSV*

#### Custom Models

*Custom Model Definition*

*Custom Model Creation from Image*

*Export Custom Model*

*Import and Create a Custom Model*

#### Model Examples

#### Model Groups

#### Moving Models Around

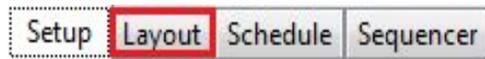
#### Aligning Objects

#### Background Image



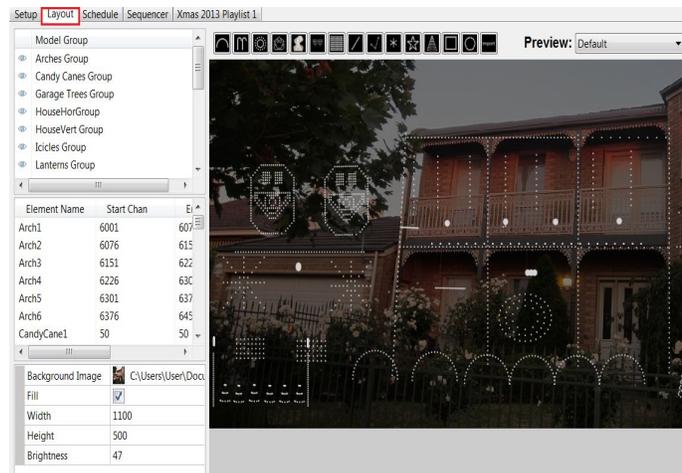


## Layout



The layout tab displays a full preview of your show and provides a view of how all the models will appear. In addition you can :

- Define new Models or change existing Model definitions.
- Define new Model Groups or change existing Model Group definitions.
- Select which Models, or Model Groups are be displayed on the Layout.
- Select and adjust the layout background.
- Specify, position and adjust the model size , orientation and location on the layout.
- Check whether any models have overlapping channels.
- Review or change the detailed characteristics of a model's attributes
- Create Additional Preview layout windows
- Assign Models to one or more Preview Layouts

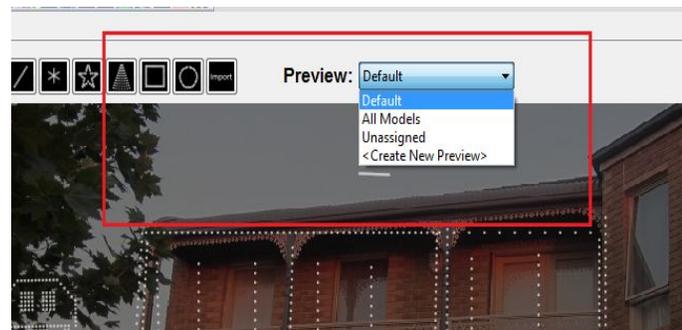


### Layout Views

You can select which models you wish to see on your Layout view. This is done by first selecting the Preview that you want to be active from the Preview selection window.

There are three built in preview options: 'Default', 'All Models' and 'Unassigned'. You also have the ability to create new preview windows.

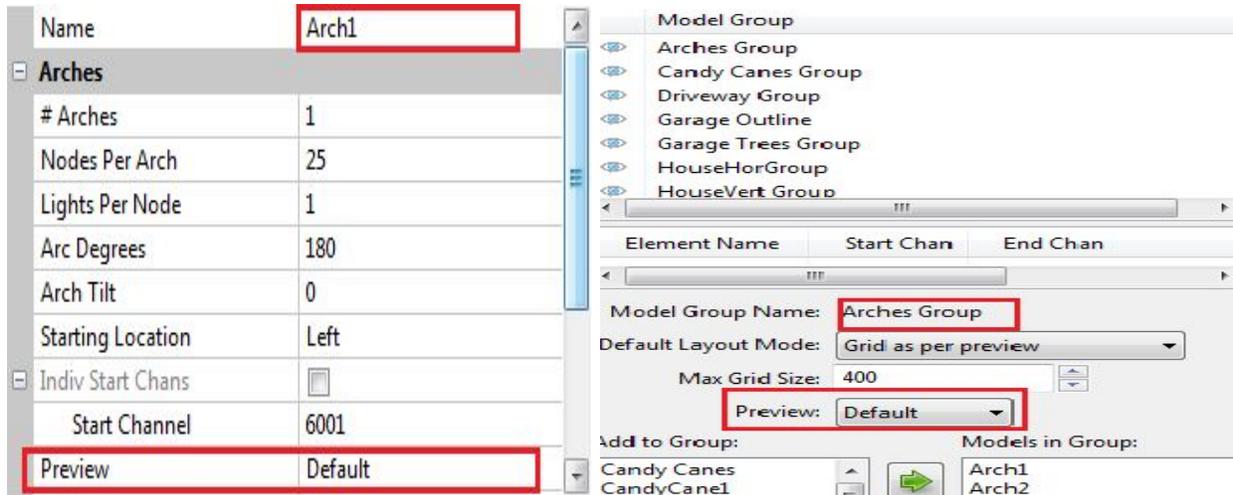
*Default*



If you only plan on having one preview, which is what most people will have, then this is the one to use.

Select the default 'Default' preview which will then display the models where either:

- The Preview attribute against the model definition has been set to 'Default'.
- The Model is part of a Model Group where the Preview attribute has been set to 'Default'.



**Note:** If a Model Group selection has been activated by clicking on the Model Group name or on the ‘eye’ to the left of the Model Group name, then that acts as a filter and only Models that belong to that group and meet the Preview condition will be displayed. Click on the ‘eye’ again to deselect the filter condition.



### All Models

Select the Preview of ‘All Models’ which will then display all models, irrespective of

- The Preview value that has been defined against the Model definition.
- The Preview value that has been defined against the Model Group definition.



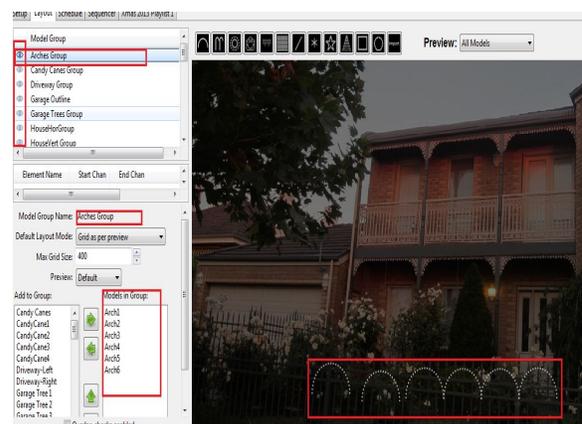
**Note:** If a Model Group selection has been activated by clicking on the Model Group name or on the ‘eye’ to the left of the Model Group name, then that acts as a filter and only Models that belong to that group will be displayed.

Click on the ‘eye’ again to deselect the filter condition.

### An Individual Group

In the following example, only the Arches group has been selected.

Therefore models Arch1 .. Arch6, which are part of the Arches group are displayed.

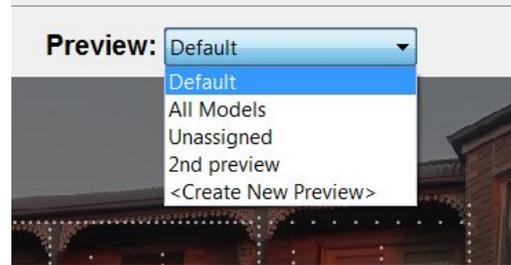




The 'eye' to the left of the Model group name or the Model group name can be clicked to select an Individual group. Selecting another group will deselect the previous one. Click on the 'eye' to deselect all the Groups.

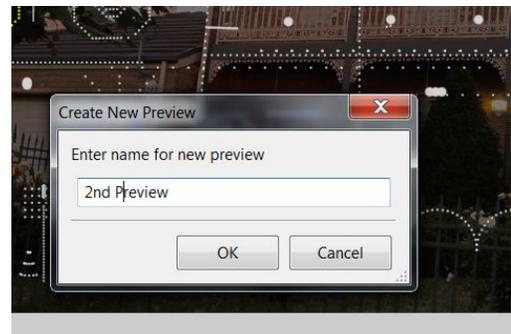
### Preview Layouts

The Preview Window displays the available preview windows, enables you to select a different view and also enables you to create additional Preview Layout windows. To create a new Preview Layout, select the <Create New Preview> option from the window.



**Note:** When would you create an additional Preview layout? If you had a corner block and you wanted to sequence from 2 directions or if you have a really wide block you can split it so everything does not become small, or if you are sequencing multiple houses in your street.

Enter the name for the Preview Layout and click Ok.

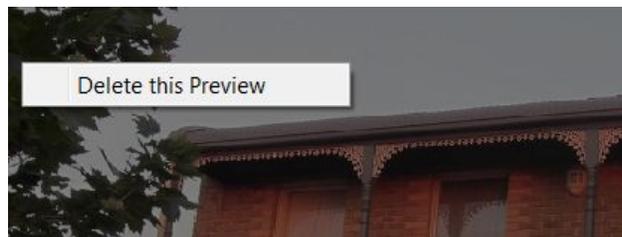
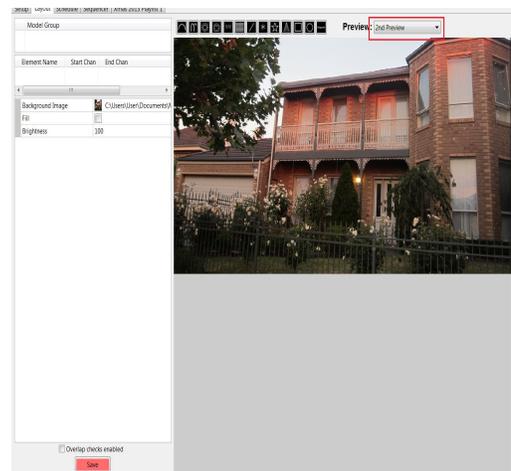


The new preview window will be created and the image that has been used for the default Preview will be selected.

Click on the Background Image attributes to browse for and select a different image if required. Otherwise, adjust the fill attribute value and the brightness value.

The image size has to be the same as the default image and as such, it is not available to change. Click on the Save button to save it.

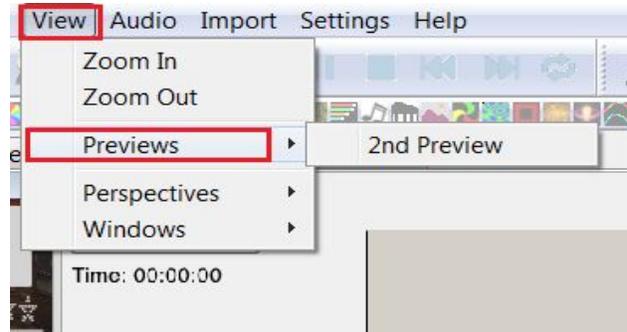
The preview window can now be used to create Models or Model Groups against similar to the Default Preview layout.



If you wish to delete the preview, right click within the window and click on the 'Delete this Preview' option.



When an additional Preview is created, a 'Previews' option to select and open it on your sequencer will be available on the View menu. Click on the preview name to open the Preview window. This option is not available if only the Default preview exists.



### Models

A model in xLights defines the entire required characteristic about a single physical element of your display. Typically it will represent a common item such as an arch, a matrix, a straight line, flood light as well as more esoteric and custom made items such as singing trees, candy canes, a snowman etc.

It defines the type of lights, the number of channels and other characteristics required to render the sequence data. When a model is defined, it is retained in an xLights configuration .xml file in the show directory. It can be reused for all subsequent sequences – however it needs to be added to the sequence grid of each sequence as required in order for effects to then be sequenced against the model.



**Note:** Refer to the View section on how this can be automated using Views.

A model is made up of one or more strands, and each strand is made up of one or more nodes.

At the top of the layout screen is a row of Model icons. If you hover the cursor on each icon, the model name will be displayed. The model icons represent an Arch, Candy Cane, Circle, Custom model, Icicles Matrix, Single Line, Spinner, Star, Tree, Window Frame, Wreath and Import Custom. The last icon labelled 'Import' Custom enables you to import and create a custom model that has been exported from another sequence.



### Creating a New Model

To define a new Model, click on the Model icon that you wish to create once. The model icon will have a dark blue square around it. Then with your mouse left button click on the layout canvas, and keep your mouse button still held down. The model shape will appear on the canvas in yellow. If it does not, then left click on the canvas and drag slightly. At the same time, a model is created and displayed in the Model panel that is normally to the left of the Layout screen.

Depending on the type of model, it will either be bounded by four, three points or two points.

In this image, the Candy canes have three points. The bottom left is green and marks the beginning of the model, the bottom right is blue and marks the end of the model and the top centre is blue and is used to rotate the model.

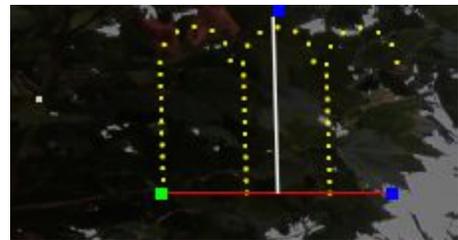


If you cannot locate your model after it has been created, click on the model name in the panel and the model image will be highlighted.

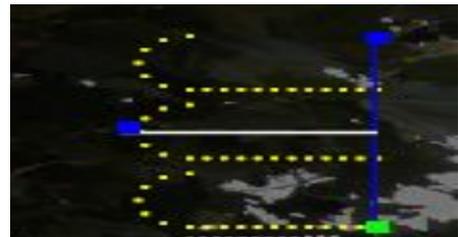
Note that the Preview window has the 'Default' preview displayed - indicating that the model that is being created will be assigned to and displayed on the default House Preview window.

By clicking and holding in the centre of the model - you can drag the model to the required position. You can also use the three points to size the model on the layout.

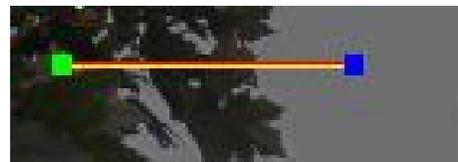
When the model is aligned horizontally, a red horizontal line will be displayed.



When the model is aligned vertically, a blue vertical line will be displayed.



In this image, the Single Line model has two points. The bottom left is green and marks the beginning of the model, the bottom right is blue and marks the end of the model. The red superimposed red line indicates horizontal alignment.



If you double click on the Single Line model icon (instead of using a single click) , then you can draw a single line (say as part of the roof line), then click on the layout again and draw another segment from the end of the first segment - this will create another model and so on. Or you can use this technique to draw multiple arches at the same time. Click on the model icon again to deselect it.



**Tip:** Both of the above examples have alternate ways of being implemented (using the Poly Line model or using the '# of Arches ' attribute' in the model definition of the Arch model).



On the left of the layout canvas is a window which displays the name of the model that has just been created, the attributes of the model and the grid position on the layout.

These are default values and you can then edit the values to suit your requirements - (change the name, start channel , number of nodes etc).

Click on the Preview attribute and change the Preview window if you so require. Set it to 'Unassigned' if the model is not to be displayed in the House Preview window.

You can collapse or expand any of the windows of the model characteristics.

Element Name	Start Chan	End Chan
Arch4	6226	6301
Arch5	6301	6376
Arch6	6376	6451
<b>Candy Canes-3</b>	<b>1</b>	<b>162</b>
CandyCane1	50	50
CandyCane2	51	51
CandyCane3	53	53

Name	Value
<b>Candy Canes</b>	
# Canes	3
Nodes Per Cane	18
Lights Per Node	1
Height	1
Cane Rotation	0
Reverse	<input type="checkbox"/>
Sticks	<input type="checkbox"/>
Indiv Start Chans	<input type="checkbox"/>
Start Channel	1
Preview	Default



**Tip:** If a Model group name is selected when you create a model , the model will automatically be assigned to the selected Model Group.

### Deleting Models

To delete a model, highlight the model image on the Layout canvas and press the Delete key or press Ctrl X. If the model is a series of dots, then hold down the cursor and drag to form a rectangle around the dots (representing the model) and then delete.

You can also Right Click on the Model name in the Model list panel. A 'Delete' pop up window will be displayed. Click on it to confirm and delete the model.

Element Name	Start Chan	End Chan
<b>Candy Canes-1</b>	<b>1</b>	<b>162</b>
CandyCane1	50	50
CandyCane2	51	51
CandyCane3	53	53

Name	Value
<b>Candy Canes</b>	
# Canes	3
Nodes Per Cane	18

### Undo

You can also use the Undo function i.e Ctrl Z to remove the model that has just been added or undo the last model movement. The Undo function can be repeated.

### Creating Multiple Model Instances

You can select the model image on the canvas, press Ctrl-C to copy and then Ctrl-V to paste. A new model instance will be created. You can also double-click on the Model icon that you wish to create. The model icon will have a grey/light blue square around it. Then with your mouse left button click on the layout canvas. The model shape will appear on the canvas (surrounded by five blue squares). A left click on the canvas again at the required location will create another instance of the model. And so on. To end the process, click on any of the model icons once.

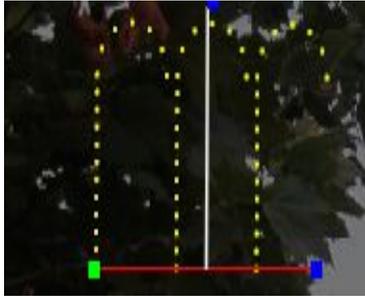


## Model Attributes

### Basic Attributes

The Model name can be changed by clicking on the existing name and changing to a new value.

Candy Cane model



The '# Canes' value can be set to the number of canes that the model represents (normally one). Similarly you can set the nodes per cane and lights per node (normally 1). The angle of the cane can be adjusted by changing the Cane Rotation value, or grab and move the top of the cane clockwise or anti clockwise.

Select the Reverse attribute to set the the crook of the cane facing the opposite direction. Select the Sticks attribute to set the cane to be a straight line without the curved crook.

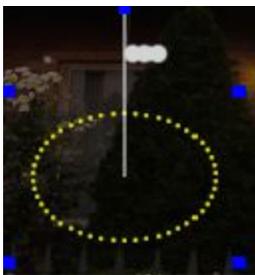
In this example , a Candy Cane model has three canes in one set. Each cane has 18 nodes in it. single channel string of about 20 lights in it.

The start channel address is 1 and it is has RGB pixel nodes so it will use 54 channels. Note that the preview is Unassigned and therefore it won't appear on the default display.

**Tip:** The three canes represent one model. If you wish to have them separated, then change the '# Canes' value to 1 and copy and paste them as separate models.

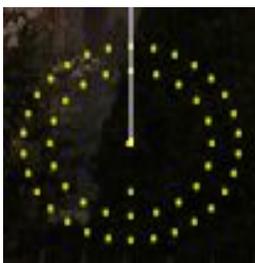
Name	Candy Canes-2
<b>Candy Canes</b>	
# Canes	3
Nodes Per Cane	18
Lights Per Node	1
Height	1
Cane Rotation	0
Reverse	<input type="checkbox"/>
Sticks	<input type="checkbox"/>
Indiv Start Chans	<input type="checkbox"/>
Start Channel	1
Preview	Unassigned
Strand/Node Names	--Click To Edit--
Faces	--Click To Edit--
Dimming Curves	--Click To Edit--
States	--Click To Edit--

Circle model



The # of Strings corresponds to the physical number of strings for that model and is generally 1. The lights per String represents the physical number of light nodes, bulbs or pixels.

The starting pixel is at the bottom of the circle. If physically your wiring is different, say it is connected in at the top, then you can rotate the image of the circle (by grabbing onto the top blue circle) by 180 degrees.



In the Layer Sizes attribute, you can add values to describe concentric rings in the circle. such as '10, 10, 10' or '30, 20, 10' (without quotes) where each number represents the number of nodes in that ring - the sum must add up to the number of nodes in the model.

It is also expected that each ring will be wired in a circle, with the outside ring first and then the next inner ring wired and so on.



The Center % is used to indicate how much area the empty area of the circle occupies.

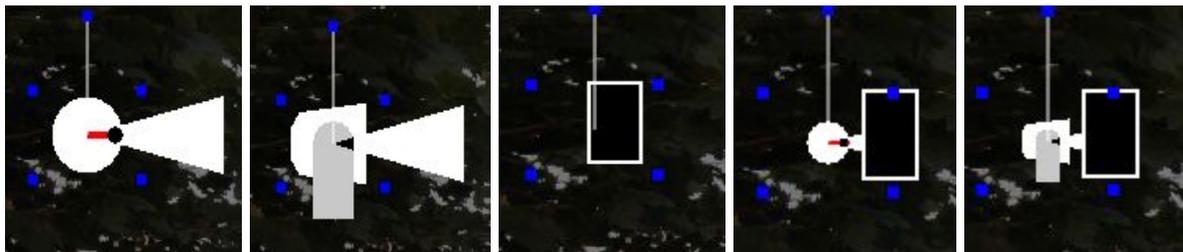
Decreasing it will drop the circles inwards and increasing it will push the circles outwards.

In this example, the Start Channel has been set to start immediately after the 'Candy Canes-2' model.

xLights will automatically calculate the start channel and end channels, and if the 'Candy Canes-2' model's channels change, then the start and end channels for this model will automatically be recalculated.

Name	Circle-1
<b>Circle</b>	
# Strings	1
Lights/String	60
Center %	50
Layer Sizes	30,20,10
Indiv Start Chans	<input type="checkbox"/>
Start Channel	>Candy Canes-2:1
Preview	Default
Strand/Node Names	--Click To Edit--
Faces	--Click To Edit--
Dimming Curves	--Click To Edit--
States	--Click To Edit--
<b>String Properties</b>	
String Type	RGB Nodes
Color	<span style="color: red;">■</span> Red

DMX model



The DMX model has a number of different styles and each has a different model representation.

The first one above is the Moving Head Top view, the next is the Moving Head Side view, the 3rd is the Moving Head Bars view, the 4th is the Moving Head Top Bars and the 5th is the Moving Head Side Bars view.

The # of Channels defines how many channels the model uses.

The Pan attributes define the channel controlling the Pan movement, it's orientation and the degree it rotates up to.

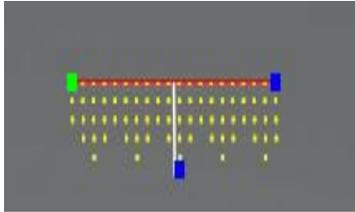
The Tilt attributes define the channel controlling the Tilt movement, it's orientation and the degree it rotates up to.

The next three attributes define the channels controlling the red, green and blue colors.

<b>DMX</b>	
DMX Style	Moving Head T <span style="float: right;">▼</span>
# Channels	8
Pan Channel	1
Pan Orientation	0
Pan Deg of Rot	540
Tilt Channel	1
Tilt Orientation	0
Tilt Deg of Rot	180
Red Channel	3
Green Channel	4
Blue Channel	5
Indiv Start Chans	<input type="checkbox"/>
Start Channel	>Candy Canes-3:1
Preview	Unassigned
Strand/Node Names	--Click To Edit--
Faces	--Click To Edit--
Dimming Curves	--Click To Edit--



## Icicles model



The # of Strings would normally be 1.

The Lights per String represents the physical number of light nodes, bulbs or pixels.

You can drag the green or top blue pixel to hang the icicles at an angle and then drag the lower blue pixel to cause the drop to shear and hang vertically shear.

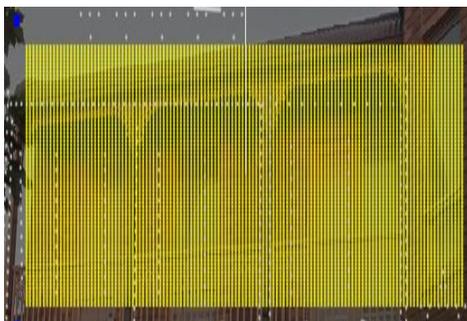
The drop pattern indicates how the pixels are arranged on each drop and how many.

So, if the total lights on the string is 80 and the drop pattern is 3,4,5,4, this indicates that the first drop has 3 nodes, the next 4, then 5 then 4.

This pattern is then repeated until 80 nodes have been accounted for.

Name	Icicles
<b>Icicles</b>	
# Strings	1
Lights/String	80
Drop Pattern	3,4,5,4
Starting Location	Left
<b>Indiv Start Chans</b>	
Start Channel	1
Preview	Default
Strand/Node Names	--Click To Edit--
Faces	--Click To Edit--
Dimming Curves	--Click To Edit--
States	--Click To Edit--
<b>String Properties</b>	
<b>Appearance</b>	
<b>Size/Location</b>	

## Matrix model



The direction can be defined as horizontal (the most common) or vertical. The '# Strings' refers to the number of vertical columns of the matrix and the Lights/string refers to the number of nodes in each horizontal row.

The starting location indicates where the matrix is connected to the controller (or where channel 1 of the matrix is).

This is an example of a horizontal matrix used to define a P10 panel matrix.

Each panel is (32 W x 16 H) pixels and the panel matrix is 8 panels in landscape. The Start channel number is 11800.

For P10 panel matrices run off the BBB using the falcon player, the matrix must always be defined as a horizontal matrix starting at the top left corner, irrespective of how the panels are physically oriented.



## Single Line model



The '# Strings' is almost always set to 1 .

The Nodes / String indicates how many nodes the string has and the Starting Location indicates whether it runs from left to right or vice versa.

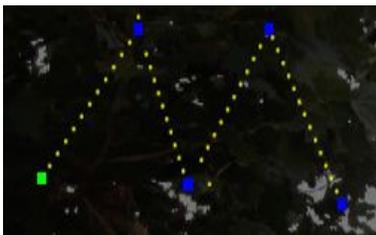
In this example, the single strand model has ten nodes and starts at channel 7240. It runs from left to right.

In the case if you have a vertical setup , then the first channel should match the node connected to the controller or end of the previous model.

Accordingly change the orientation of the model to match that. You can however, reverse the orientation in many hardware controllers as well.

Name	PipeL
<b>Single Line</b>	
# Strings	1
Nodes/String	10
Lights/Node	1
Starting Location	Left
<b>Indiv Start Chans</b>	<input type="checkbox"/>
Start Channel	7240
Preview	Default
Strand/Node Names	--Click To Edit--
Faces	--Click To Edit--
Dimming Curves	--Click To Edit--
States	--Click To Edit--
<b>String Properties</b>	

## PolyLine model



The Poly Line model enables several straight line or curved segments to be drawn as one model (rather than having to draw them as individual models).

This model is useful for the roof line , rafters , fences etc where the lines are at an angle to each other.

To draw, select this model and drag on the layout as usual. At the end of each segment, click once with the mouse left button, then draw another segment. Left mouse button Click to end the segment.

At the end press the ESC key (after the Click) to deselect the drawing action. You can then grab any of the blue or green pixels and move it around to change the shape of the model image.



The # of Nodes defines the total number of nodes for the entire model, the Lights/Node is normally one and the Starting location can be the left or Right.

Enabling the Individual Segments attribute selecting will present the different segments that form the poly line model.

You may end up with some in-between lines you don't want. So then check Indiv Segments and start clicking on each segment line in the property grid. It will highlight each segment as you click on them. Once you get to one of the "in-between" lines you don't want just type in a "0" for segment size and it will disappear from the drawing.

You can change the number of nodes in each segment.

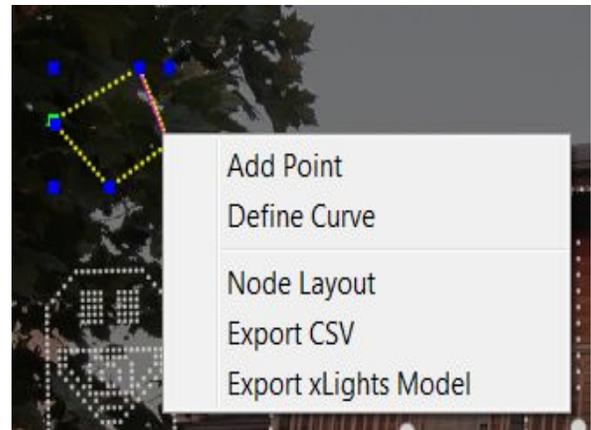
You can also name all your line segments.

Name	Poly Line
<b>Poly Line</b>	
# Nodes	50
Lights/Node	1
Starting Location	Left
Indiv Segments	<input checked="" type="checkbox"/>
Segment 1	13
Segment 2	15
Segment 3	10
Segment 4	12
Indiv Start Chans	<input type="checkbox"/>
Start Channel	1

Adding Segments

To add a segment to an existing model, right click on a segment of the poly line model; the segment color will change to red.

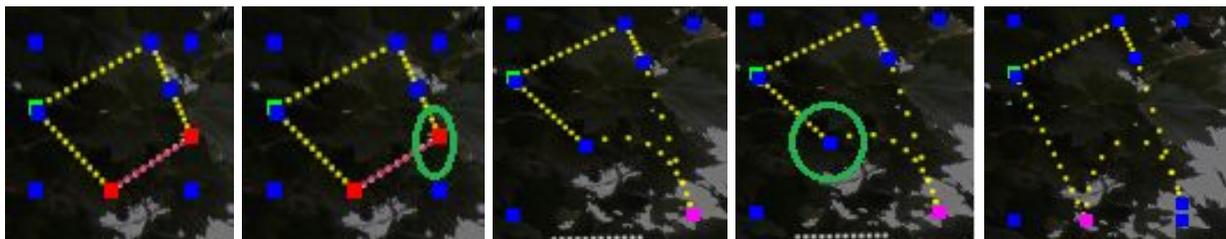
Then select Add Point and a point will be added to the segment. The number of segments will increase by one. You can then work with the new segment and change the number of nodes via the panel.



Segment Curves

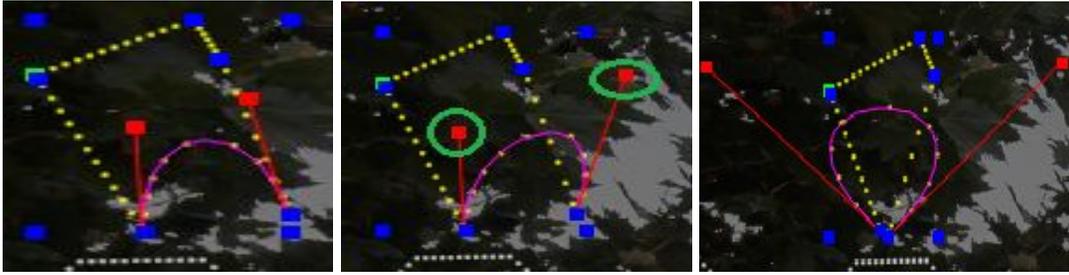
If you Right click on a segment, the segment color will change to red.

You can then modify the straight line segment into a curved segment by selecting Define Curve. Grab one edge of the segment and drag it in the direction that you want the line to curve. Then select the other end of the segment and drag it in the direction you want to form a curve. Note the pink dots that denote the end of the curve that you are working with,





Click on the curved line and two straight red bars will be displayed from either end. You can then grab the end of the bar and drag it in any direction to stretch or move the curve .



Spinner model



The number of Strings is normally set to 1.

The Arms/String represents the number of Spokes and the Lights/Arm represents the number of nodes on each arm.

The Hollow % is used to control the gap at the base (ie center) of the spinner model.

The Arc can be used to denote whether the model is a 360 degrees spinner or say a 180 (sem circular spinner) or anything in between.

The Starting Location, besides indicating which is the first channel of the model, is also used to denote how it is wired. There are 4 definitions supported (wired from the center, wired from the outside and for either whether the nodes move clockwise or counterclockwise).

When wired from the centre, the starting location must be as indicated with the red rectangle and the pixel direction is outwards on all arms.

When wired at the edge, the starting location must be as indicated with the green rectangle and the pixel direction is inwards on all arms.

The zig zag attribute is to be selected if the wiring is say - inwards on one arm and then outwards on the next and then inwards etc or outwards on one arm and then inwards on the next and then outwards etc.

Name	Spinner
<b>Spinner</b>	
# Strings	1
Arms/String	5
Lights/Arm	10
Hollow %	20
Arc	360
Starting Location	End Counter Clockwise
Zig-Zag Start	<input type="checkbox"/>
<b>Indiv Start Chans</b>	<input type="checkbox"/>
Start Channel	1
Preview	Default
Strand/Node Names	--Click To Edit--
Faces	--Click To Edit--
Dimming Curves	--Click To Edit--
States	--Click To Edit--

Star model

The # Strings is normally set to 1 and the Lights/String denotes the total number of nodes on the model. The # of Points describes the points of the star and the starting location indicates where the first node is and which direction it is progressive.



For multilayer stars, use the Layer Sizes attribute to indicate the number of nodes in each layer i.e can be 30,20,10 (outer ring to inner most ring).

The sum total of all rings must tally with the total nodes ( # strings \* Lights/String ) value.

In this example, the start channel is 8000.

Name	Stars1
<b>Star</b>	
# Strings	1
Lights/String	20
# Points	5
Starting Location	Top Ctr-CCW
Layer Sizes	
<b>Indiv Start Chans</b>	<input type="checkbox"/>
Start Channel	8000
Preview	Default
Strand/Node Names	--Click To Edit--
Faces	--Click To Edit--
Dimming Curves	--Click To Edit--
States	--Click To Edit--
<b>String Properties</b>	
<b>Appearance</b>	

Tree model



The type of tree can either be round , flat or ribbon.

The Degrees attribute indicates whether the tree is a full (360 ) , half (180) or three quarters (270) tree or any other value.

The # of Strings corresponds to the physical number of strings for that model. Typically an arch or a candy cane will have one string, but models such as a mega tree or a matrix will have many strings.

The lights / String represents the physical number of light nodes, bulbs or pixels. The Strands per String is usually 1, except in the scenario where a physical string has been folded in which case it can be 2, 3, 4

etc.}

The Spiral Wraps attribute defines many times a strand is wrapped around the tree. 1.0=one full wrap, 2.5 = 2 1/2 wraps from bottom to top. The bottom / top ratio can be used to adjust the cone shape of the tree.

The Starting Location is used to define where the first node starts in a multidimensional model (i.e. a matrix or mega tree). Set to the default value of Bottom Left if running from left to right or Bottom Right if running from right to left.

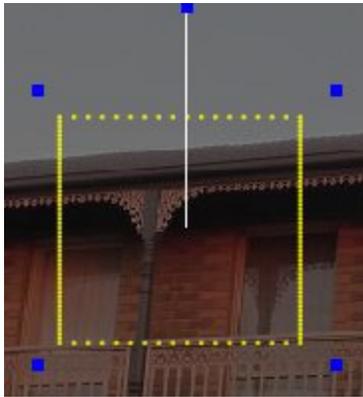


In this example, a 360 degree Mega Tree visually - 30 strings of 25 pixels on each string, however, physically made of 15 strings of 50 pixels each.

Each string starts from the bottom, goes up to the top of the tree and loops back down. So half the number of physical strings are required.

The first node is in the front bottom left and starts from channel address 9200.

Window Frame model



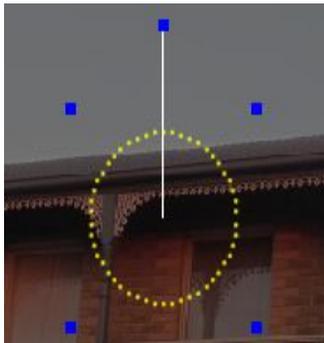
For this model, you define the # of nodes on the top, left/right and bottom. Rectangular frames are supported where the top/bottom has one set of values and the left/right another.

The left/right value must be the same, however you can adjust the top or bottom value to say zero (to represent a door).

The starting location indicates where the first node is.

Name	Window Frame
<b>Window Frame</b>	
# Lights Top	16
# Lights Left/Right	50
# Lights Bottom	16
Starting Location	Bottom Left
Start Channel	1
Preview	Unassigned
Strand/Node Names	--Click To Edit--
Faces	--Click To Edit--
Dimming Curves	--Click To Edit--
States	--Click To Edit--
<b>String Properties</b>	
<b>Appearance</b>	
<b>Size/Location</b>	

Wreath Model



This model is similar to the the circle model, however when you change the # Strings to more than one , another circle is created at the same circumference of the model rather than another layer within.

The other attributes are similar to other models.

Name	Wreath
<b>Wreath</b>	
# Strings	1
Lights/String	50
Starting Location	Bottom Ctr-CW
<b>Indiv Start Chans</b>	
Start Channel	1
Preview	Unassigned
Strand/Node Names	--Click To Edit--
Faces	--Click To Edit--
Dimming Curves	--Click To Edit--
States	--Click To Edit--
<b>String Properties</b>	
<b>Appearance</b>	
<b>Size/Location</b>	



### Individual Start Channels

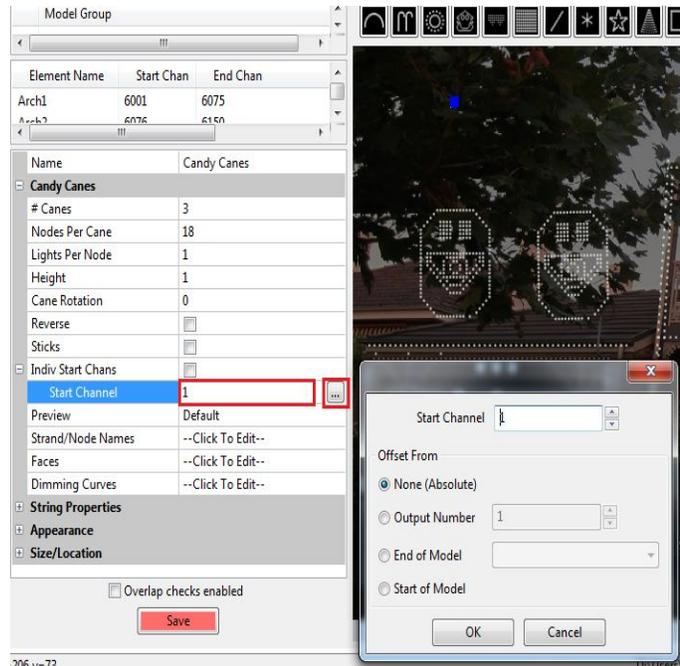
For models with multiple strands or elements, you can specify the start channel for each strand individually if required. This is useful where the channel numbering is not contiguous.

The Start Channel corresponds to the starting channel of the first node for the model. xLights will automatically calculate the end channel.

The From Output in most cases is set to 1 as default and the start channel is then used to define the absolute channel number.

However it is possible to use other definition setups:

Click within the Start Channel cell and then click on the highlighted box to open up a secondary window.



If you select the 'Output Number' option, the start channel for the model is calculated based on the "start channel" that is offset from this 'From Output' number (default is 1). The Output number refers to the row on the Setup tab.

If you have 4 outputs setup on your setup tab being universes 10 through 14, all with 510 channels, for the model set as Start Channel "1", Output Number "2", its real start channel in the fseq would be channel 511 (first channel of the second output). But the universe would be 11 (as that is on the second row i.e Output 2 of the set-up tab), not Universe 2.

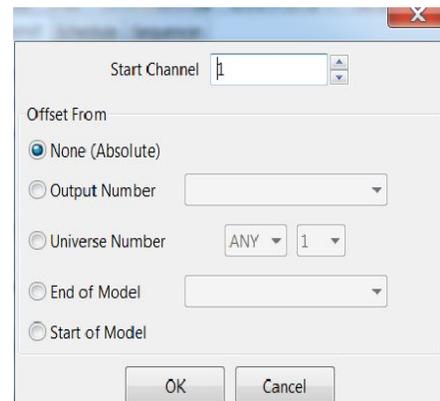
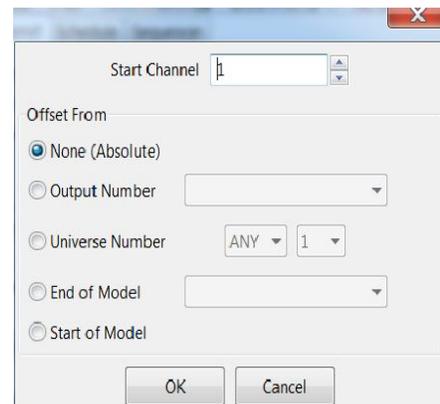
If you select the 'Universe Number' option, the start channel for the model is calculated based on the "start channel" that is offset from this 'Universe Number'.

If you have 4 outputs setup on your setup tab being universes 10 through 14, all with 510 channels, for the model set as Start Channel "1", From Universe "11", its real start channel in the fseq would be channel 511 (first channel of the Universe 11).

The "ANY" value indicates that the Universe is not specific to an IP address and therefore xLights searches for the universe number.

You can specify a specific ip address if you wish - in the unusual event that you have the same universes on different controllers on different ip addresses.

The start channel value can also be specified relative to other channels using the End of Model or Start of Model options. You can specify an offset from an output number





or select the start channel to start from the end of another model or align with the start of another model (in the last two scenarios, the model name is to be selected from a drop down box).

This options works well if your models are reasonably static as the channel numbers are automatically calculated. If however, you delete models then it can break the chain . xLights will alert you to this , but the popup dialogs could be tricky to navigate through.

### Preview Display

The Preview attribute controls whether the model is to appear in the House Preview screen and also which Preview layout screen. Click within the attribute to open up a window which lists all the available Previews. If you have created additional Preview layouts , they will be listed in the window.

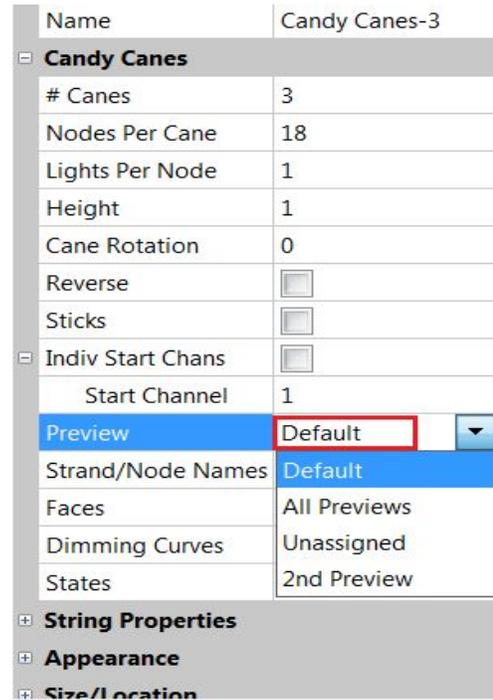
The 'Default' value represents the default preview window.

'All Previews' indicates that the Model is to be displayed in all Preview Windows.

'Unassigned' indicates that the model will not be displayed as it is not assigned to a Preview window.

'Unassigned' is sometimes useful where the same physical item has been re-defined using more than one model definition for ease of programming the effects. One of them should have the Preview set to 'Unassigned' and the other should not.

The '2nd Preview' is one that has been user created.

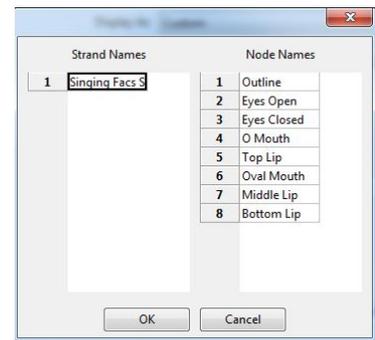


 **Note:** There are 4 rules to determine if a model shows up on a Preview.

1. The model is assigned to the Preview.
2. The model is assigned to All Previews.
3. The model is a member of a model group that is assigned to the Preview.
4. The model is a member of a model group that is assigned to All Previews.

### Strand / Node Names

Each strand and node can have a name assigned to it. This is useful where for example you have single channel models that are grouped together (singing faces, tombstones or DMX props etc). On the sequencer, double clicking on the strand reveals the nodes with meaningful names against them.



### Faces

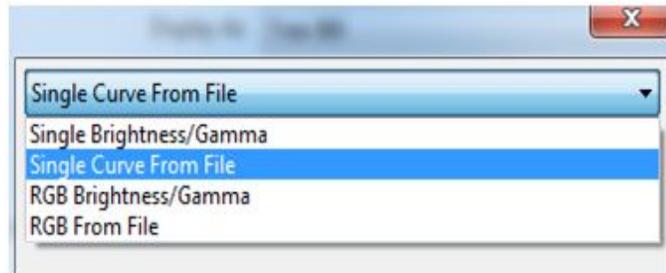
This attribute is used to specify the Faces definition for custom models that support Singing faces. Functionality has been covered in the Singing Faces section.



### *Dimming Curves*

The Dimming Curves setting can be used to change/reduce the brightness of the lights for a specific model. The intensity of the lights is accordingly changed/reduced from its default value of 100%. Use the "Brightness" slider where you can reduce (or increase, but 99% of the time, you reduce) the brightness of the model in the FSEQ. Change the gamma curve of each of the red, blue or green values.

You can select from the options to have a single gamma value or change individual gamma values. You can also select the values from a file, in which case you are prompted for the location of the file.



	RGB Values
Orange	R:255 G:37 B:0
Orange	R:255 G:48 B:0
Darker Orange	R:255 G:29 B:0
Hot Pink	R:255 G:0 B:93
Turquoise	R:8 G:255 B:143
Congo Blue	R:33 G:0 B:148
J. Winter Blue	R:0 G:0 B:140
Jade	R:0 G:181 B:165
JAS Green	R:86 G:222 B:0
Med Yellow	R:255 G:247 B:0
Oklahoma Yellow	R:255 G:211 B:0
Bastard Pink	R:255 G:115 B:107
Grass Green	R:0 G:109 B:44
Royal Purple	R:40 G:0 B:123



**Note:** It helps when all of your LEDs have the same wavelength of colors in them. If one set has a darker red or blue you'll get different colors out of those on the same values.

### State

This attribute is used to specify the State definition for custom models that support Singing faces and Coro Tuine to signs.

Functionality has been covered in the State Effect section.

### String properties

The String Type enables you to set or change the 'RGB' orientation of your nodes.

The first six options in the list below are used for Pixels - these can also be set in the hardware controller. Dumb pixels are set to either 3 Channel RGB or 4 channel RGB and single "A/C" or store bought fairy lights are set to single channel.

The Color attribute is used for Single Color string types to define which color the string responds to. If set to White, then only when the White is on, on the sequence, will it light. If set to say Red, then it will light if Red is on (which is 255,0,0) or if White is on (because White sets 255,255,255 on).

Arch Tilt	RGB Nodes
Starting Location	RBG Nodes
Indiv Start Chans	GBR Nodes
Start Channel	GRB Nodes
Preview	BRG Nodes
Strand/Node Names	BGR Nodes
Faces	3 Channel RGB
Dimming Curves	4 Channel RGBW
States	Strobes
<b>String Properties</b>	Single Color
String Type	GRB Nodes
Color	Red

### Appearance

The Appearance setting is used to determine how a particular element is displayed when viewed in the Layout, House Preview and Model windows. By increasing the Pixel Size, the appearance of the element (a flood or any other small element) can be made to display a bigger size. The Transparency and Black Transparency values can be used to adjust how opaque or transparent the element is on the display.

<b>Appearance</b>	
Pixel Size	2
Pixel Style	Smooth
Transparency	0
Black Transparency	0
<b>Size/Location</b>	

### Size/Location

The size/location attributes describes where on the Layout screen a model has been placed, and its relative size to the model grid.

It auto adjusts as you move or adjust the size and orientation of the model image and normally does not have to be manually set or adjusted.

<b>Size/Location</b>	
X1 (%)	21.77
Y1 (%)	13.4
X2 (%)	28.77
Y2 (%)	13.4
Height	0.98





**Tip:** In the event that the model has ‘disappeared’ from the screen or has shrunk or is hidden behind another model, then adjusting these values to a larger value can help to locate the model after which the model image can be adjusted as usual.

### *Rename a Model*

A model (name) can be renamed by simply changing the Model name.



**Note:** If the model is already part of a Model group, you should update the Model Group definition. If you don't then xLights will subsequently provide an option to delete or select the new model name when the application is loaded again.

### *Modify a Model*

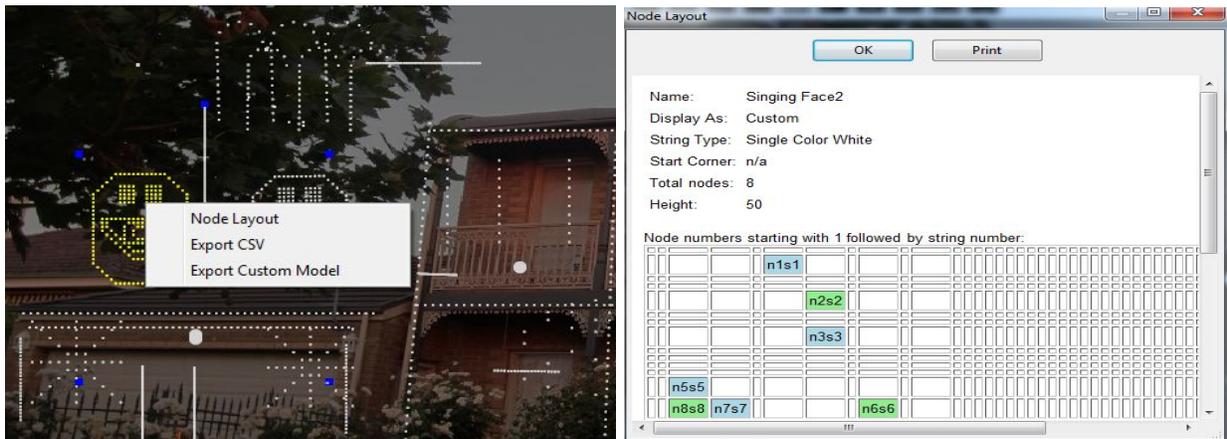
Details of a model configuration can be amended by updating the details in the relevant section of the model definition. Save the changes.

### *Copy a Model*

Once a model has been defined, a quick way to duplicate definitions is to select the model in the LAYout window, then use a Ctrl-C to copy it and a Ctrl V to paste it. Save the changes.

### *Node Layout*

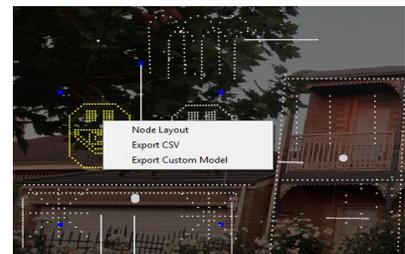
Select a model and right Click. Select Node Layout. The node layout window is then displayed.



### *Export CSV*

Select the model and right click. Select the Export CSV option. This copies the details of the model to a csv file. You will be prompted to specify a location and filename.

A single row is created for each model and includes the model name, ‘display as name’ attribute, string type, string count, node count, start channel, start node, ‘part of my display’, model brightness adjustment value.



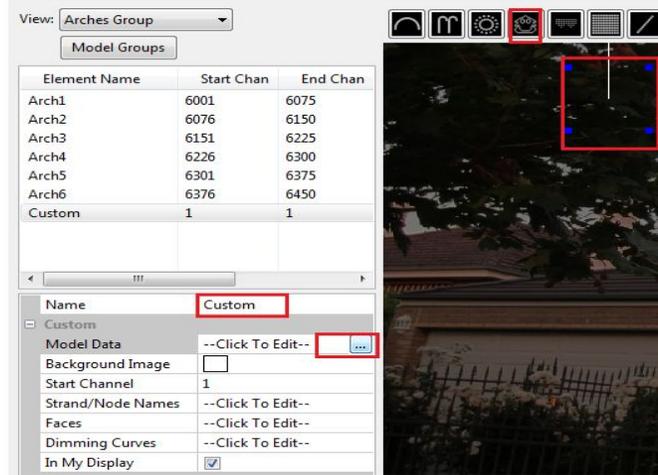
In order to obtain a csv file of all models, use the Export Models function from the Tools menu.



## Custom Models

### Custom Model Definition

xLights enables you to define models that do not fit into the concept of predesigned common shapes. For example, a snowman outline, reindeer outline, a singing face, etc. In order to define such a model: Create a new model by selecting the Create new Custom Model icon. Select an area on the Layout screen and drag the mouse across. A new Custom Model will be created with an initial model name of 'Custom' or similar. You can rename it to something more suitable. Click within the Model Data box.

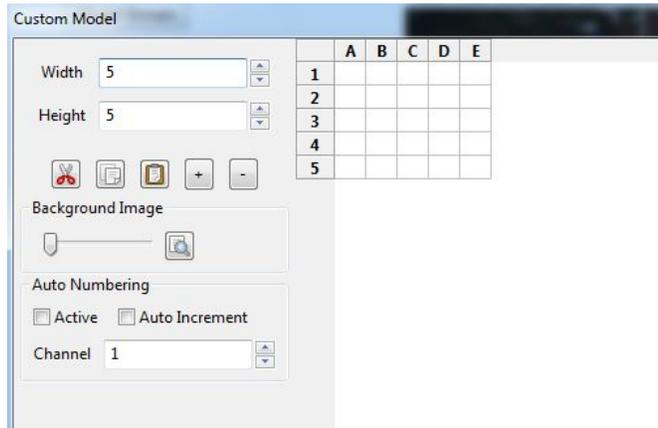


A custom model grid will be displayed in which you enter numbers in the grid representing your model.

Change the width and height values to increase the size of the grid (say 50 and 50).

If your model is a candy cane with 12 nodes, you could have a grid 4 columns wide and 10 rows high.

Place the numbers 1-9 up the right hand side, 10 and 11 in the middle cells in the top row and 12 would go in column A row 2.

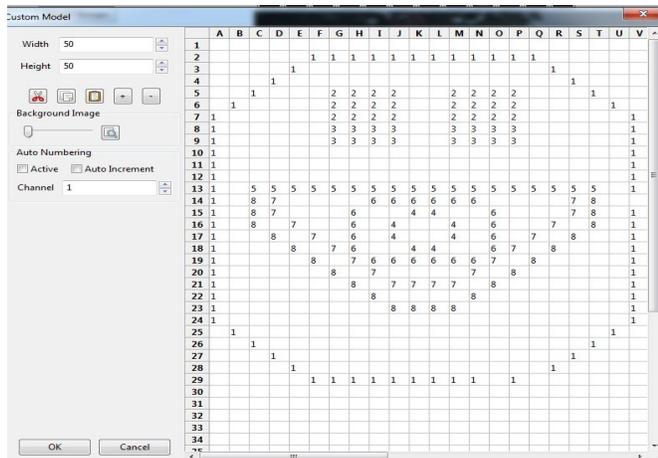


The following image is an example of a Singing Face custom model:

If you enter a number and wish to erase it, press delete in the cell.

You can delete multiple cells by drawing a box around them and then pressing delete.

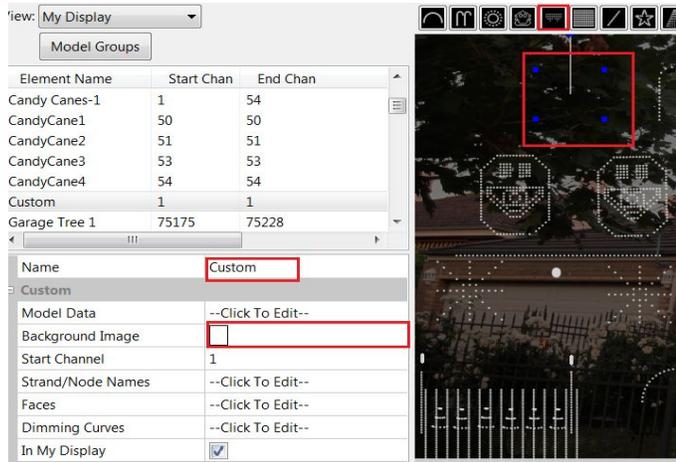
You can use the '+' and '-' keys to make zoom in and out. You can also enter the same data in Excel, copy the cells from Excel and then use the paste icon to paste the data into the cell in row 1 column 1. Save the model.



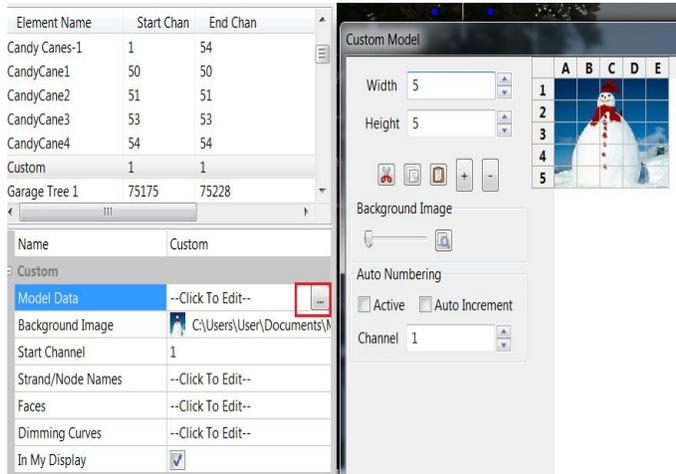


*Custom Model Creation from Image*

From the Layout screen, using the Click on the custom model icon and drag and draw a custom model. A new model with a 'Custom' or similar name will be created. Double click on the Background Image attribute. A window will prompt you for the location of an image file. Browse to and select the image.



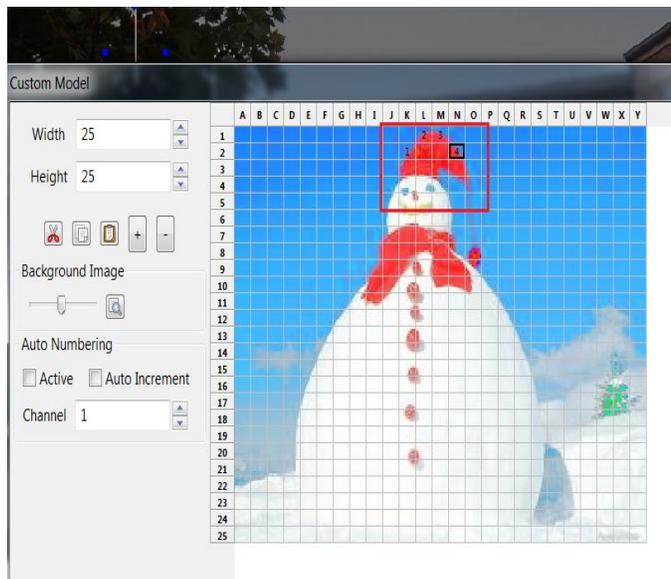
Click on the Model Data attribute. This will open up a window with the image in the background. Adjust the size by increasing the width and height values. Click on the '+' and '-' buttons to Zoom in and Zoom out to fit the image within the window.



The Background image slider can be used to adjust and reduce if required the brightness of the background so that the image is just visible. This will enable you to more easily define the numbers on the image and around the outline.

You can then start typing the numbers around the outline.

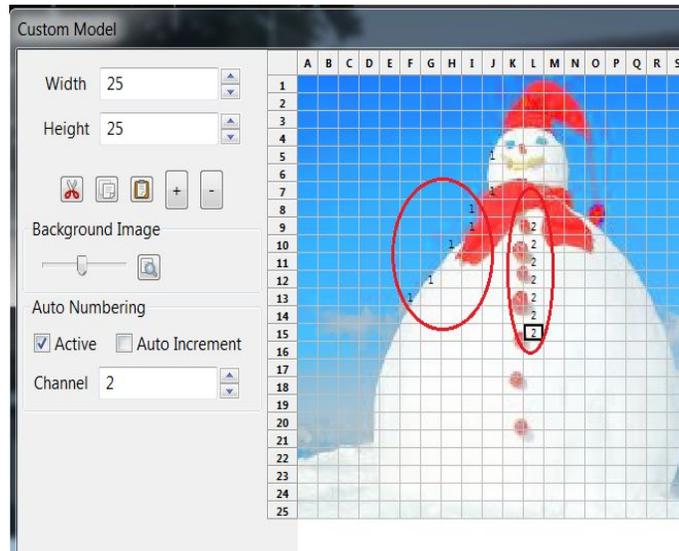
To delete the numbers, you can highlight the number in the cell and press the delete key, or draw a rectangle around the numbers to be deleted by holding the left mouse button down and then press delete.





If you select the Auto Numbering setting to be active, then you can simply click around the outline of the image (or anywhere else) and the channel number that is in the Channel Number box will be added at the points where you click.

If you select the Auto Increment setting to be active - if you had smart pixels - then when you click, the number is automatically incremented.

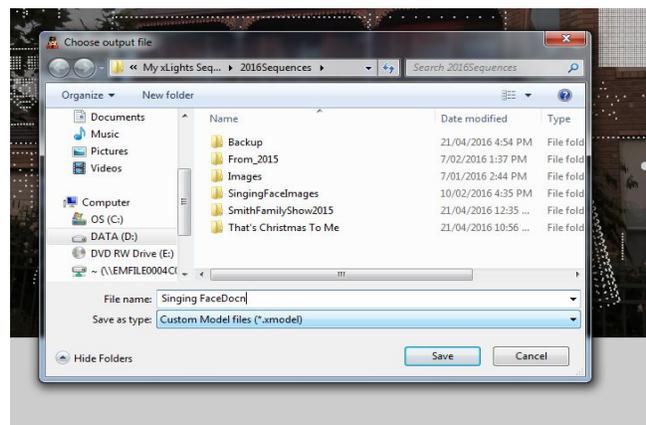
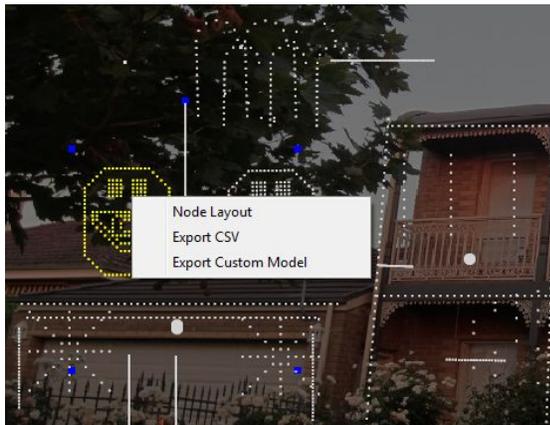


**Note:** the Channel number in the Channel Number box can be adjusted at different points in the image to control what number is used when you click.

Click on Okay to return to the layout screen at any time to view the image that has been created. You can come back and continue editing at a later time.

### *Export Custom Model*

Select the model and right click. Select Export Custom Model. You will be prompted to specify a location and filename. Enter the filename click on Save.



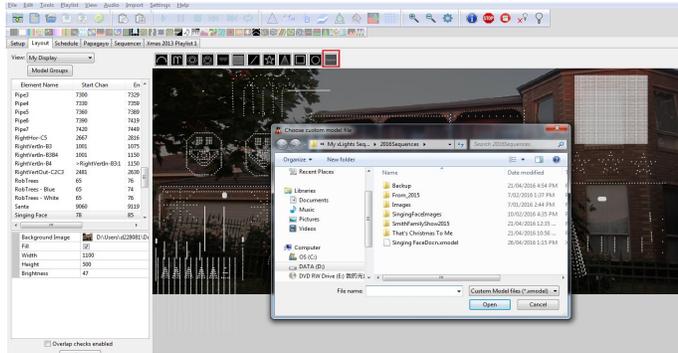
The export process will also export the faces and state definition so you don't need to redefine it when you import it.



### Import and Create a Custom Model

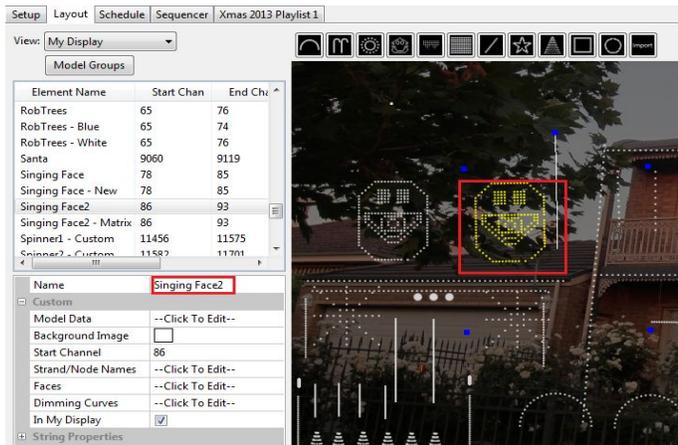
This function enables you to create a custom model in your layout from a custom model file created by another user via the Export Custom Model function

Click on the 'Create new Custom model' icon and then click on the canvas at or near the point where the new custom model is to be located. You will be prompted for the name and location of the custom model file (file type .xmodel).



Once you select the file name, a model will be created using information from the custom model file. You can edit and change the model name or other attributes.

The model will be located at the point where you had selected on the canvas and you can resize or move it using the blue connectors similar to any other model.

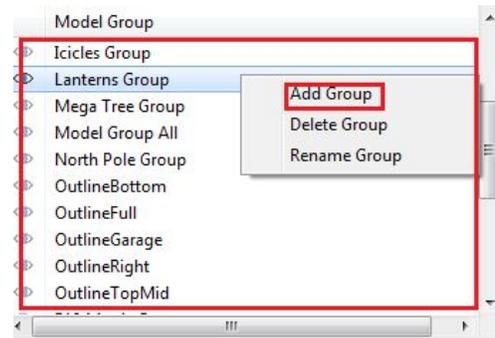


### Model Groups

A Model Group defines a collection of models. It is an optional entity, but very useful, in that many effects can be sequenced against the Model Group and xLights will then generate effects on all the Models in the group. A Model can belong to more than one Model Group. An example a model 'Arch1' can belong to the 'All Models Group' Model group as well as the 'Arches Group'

You can also have models that do not belong to a Model Group - for example a matrix that you wish to sequence effects on separately such that dropping an effect on the "All Models" group does not affect the matrix.

To create a Model Group, from the layout tab right click within the Model Groups window. Click on Add Group, enter a Model Group name in the resultant window and click Ok.





In xLights, Model Groups are sequenced against an internal grid representation.

The Default Layout Mode and Max Grid Size provides options on how the 'internal grid' is to be calculated when effects run across a model group.

If 'Grid as per preview' is selected, then the buffer used will be exactly as to how the house preview appears i.e will be quite large.

If 'Minimal Grid' is selected then the buffer area will be an area just surrounding the model group.



**Tip:** Select minimal grid wherever you can. Large grid sizes can significantly slow down rendering, particularly on some effects like fan and shockwave.

A list of all available defined models will be displayed in the left hand window.

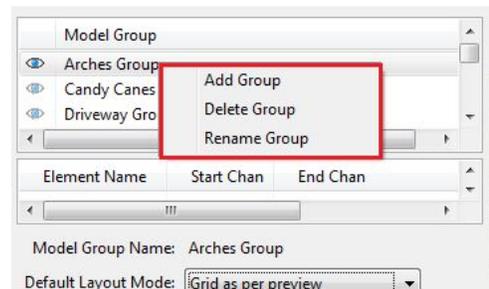
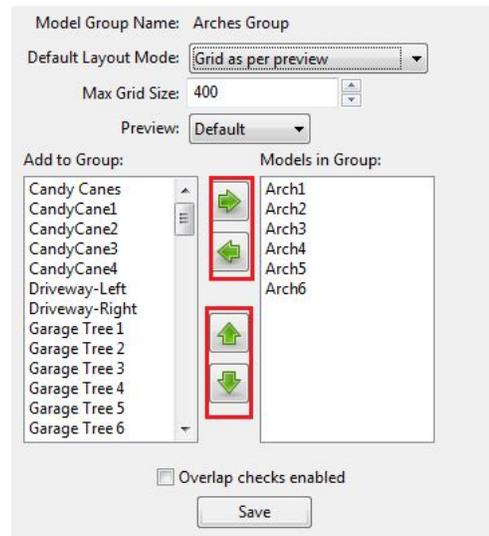
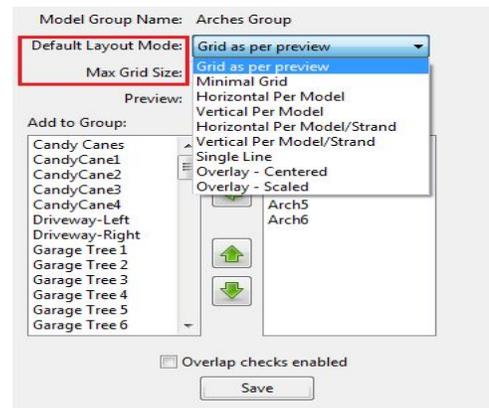
Use the arrows to add models to the Group, or remove them and to move the position up or down. Click on OK when complete.

To modify the models that form part of a group, click on the group name.

The models that are currently in the group will be displayed in the 'Models in Group' window and the other models will be displayed in the 'Add to Group' window. Use the arrows to add or remove models as required and click on the Update Group when done.

To remove a Model Group, select the Model Group from the same list, right click and select Delete Group. This will not change or remove any of the underlying models, however any effects that have been placed at that group level on the sequencer will be removed and the Model group will be removed from the Layout display if it has been added to that display.

To rename a Model Group, select the Model Group from the same list, right click and select Rename Group. Enter the new name for the Model Group.





**Note:** Selecting a Model Group from the list, sets it as a filter and only that Model Group is active on the layout; as such only models that are part of that group are displayed on the Preview screen. In order to revert back to all the models, Click on the ‘eye’ next to the Model Group name to deselect it.

If the ‘Overlap checks enabled’ attribute is selected, when you click on the model name in the list, it will turn yellow in the layout display to the right. If there is a channel overlap with any other model, then the other model will turn red.

If you hover on a model name, it will display details of the setup configuration such as the names and channel assignments the model maps to on your controller setup.

Element Name	Start Chan	End Chan
Spinner1	11456	11575
Spinner1 - Custom	11456	11575
Spinner2	11582	11701

Model Group

- Spinner Group
- Spiral Custom Group
- Spirals Group

Name: Spinner1 - Custom

Overlap checks enabled

Save



**Tip:** It is useful to have a Model Group (say “All Models”) and include all the models for your show and include that model group on the layout tab.

### Moving Objects Around

For a single object, you can left click on the object, (it turns yellow) and with the mouse button still held down, drag it around.

To move more than one object around together, press the Control key first and then left click on each object that you want to move as a group (holding down the control key all the time).

Then at the last object, drag to move all the selected objects around together. If you release the Control key at any time, the objects will not move as a group.

Another way is to Hold down shift, draw a box around the models to move, then let go of shift, and hold down alt, then move the group of models.

### Aligning Objects

Select a group of objects, right click and select Align (top, bottom etc) to align the selected objects. Which object should they all align to ?

The object you selected first i.e. which will have the blue dots is the key object that others will align to.

When selecting a group, you can press shift, a box opens and you can drag the mouse around the objects to select the group to align.





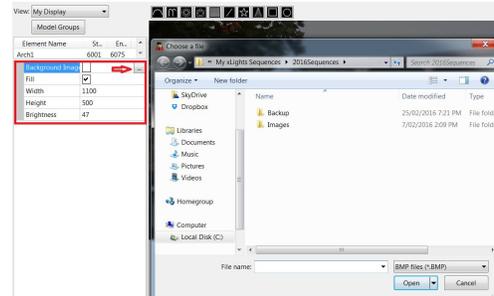
**Note:** There is no Undo for this action of dragging and setting alignment.

## Background Image

The Background image to the layout section i.e your house/yard can be set or changed via the Background Image setting section.

Click where indicated and browse to and select the background image. Change the file type if required .

Adjust the width, height and brightness attributes to your preference. The width and height depends on your screen size and resolution. If unsure, start with a .jpg or .bmp image with a resolution of around 1100 \* 500 and adjust the width and height for the best fit. The 'fill' attribute will scale the image to best fit your window. Click on the Save button to save the Layout settings.





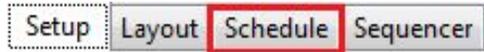
## Chapter Four: Schedule Tab

### Schedule

Running the Schedule

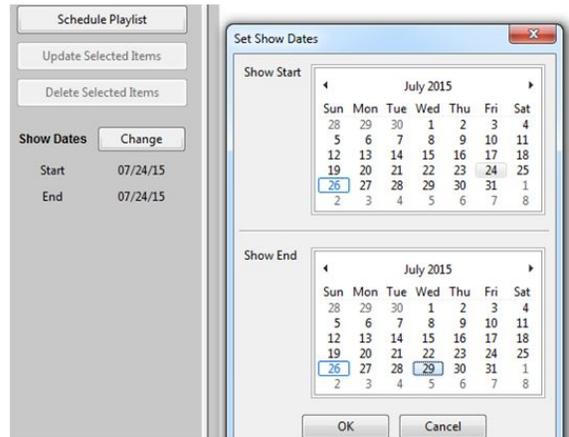


# Schedule

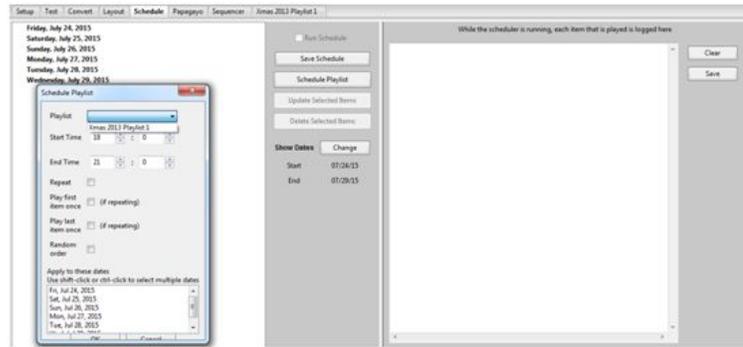


The Schedule tab is used to define schedules if you are going to use a PC/MAC and xLights to run your show. Prior to using this function, you must have defined at least one playlist via the Playlist function.

Click on the Change button next to the Show Dates label to select the Show Start and Show End date ranges for your show. Select OK when done. The date selected will then be copied to the left panel.



Click on Schedule Playlist and you will be presented with a 'Schedule Playlist' window.



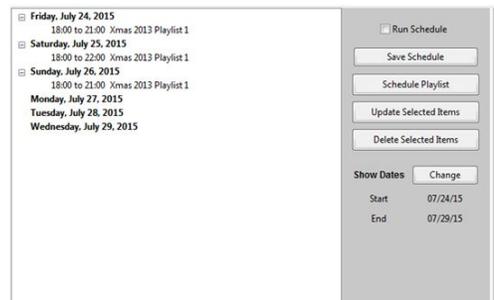
Click on the Playlist drop down window and select the Playlist.

Select the start and end times, the date or dates this schedule is applicable to and other attributes such as:

- Repeat – whether the playlist should loop back and restart if the length of the songs in the playlist is less than the schedule duration.
- Play first item only once. This option is useful if you have an Intro to your show at the beginning
- Play last item only once. This option is useful if you have a finale to your show at the end.
- Random order. Used if you want the events in the playlist to play in random fashion i.e. not sequentially.

Click on OK when done. You must click on Save Schedule to save the schedule and any changes.

You can specify different schedules for different dates in your date range. As an example, to create a different schedule for the weekend, repeat the steps above and select say a different end time for the Saturday and Sunday.



Click OK when done.

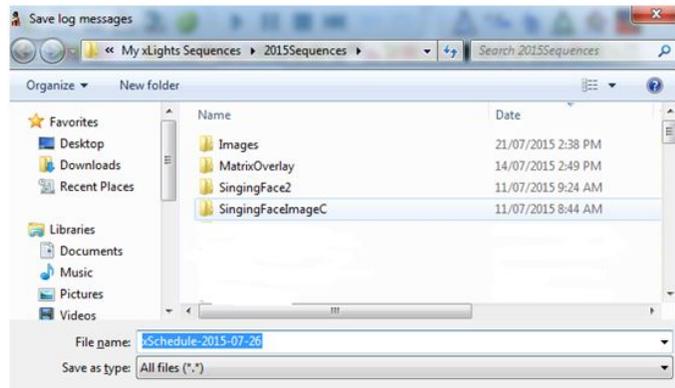
To change any schedule, select the schedule item from the list and click on Update Selected items.



To delete any item, select the schedule item and click on Delete Selected items.

### Running the Schedule

To run the schedule, ensure that the 'Output to Lights' button has been selected and click the 'Run Schedule' option. As each scheduled item is executed, the log details are displayed in the window on the right. You can clear the details by clicking on the Clear button on the right. You can save the log detail by clicking on the Save button on the right. You will be prompted for a filename for the log file.





*Intentionally left blank.*



## Chapter Four: Sequencer Tab

### Sequencer

#### Windows

#### Timing Tracks

*Import Notes*

#### Models

*Play Model*

*Export Model/Render and Export Model*

*Model Export as Video*

*Import Model*

*Strands and Nodes*

#### Render All

*Rendering order*

#### Timeline and Waveform

*Zoom In and Zoom Out*

*Scroll left/right*

*Audio Scrubbing*

#### Views

#### Effect Presets

*New Preset*

*Retrieve Preset / Apply Preset*

*Updating a Preset*

*Export Preset*

*Import Presets*

*Maintaining Presets*

#### Adding an Effect

#### Changing an Effect

*Color Curves*

*Selecting Colors*

*Single Channel Colors*

#### Moving and Stretching Effects

#### Aligning Effects

#### Copy, Paste, Delete Effects

*Copy Row*

#### Undo Effect

*Select Multiple Effects*

#### Create Random Effect

#### Pixel Editor (Matrix Drawing Tool)

*New Image*

*Load Image*

*Save As*

*Copy/Paste*

#### Playing a Movie as an effect

*Windows*

*Macintosh*

#### Shortcuts

#### Value Curves

#### Layers

*Layer Blending*

*Samples*

*Layer Blending - Morph*

*Layer Blending - Transitions*

*Layer Blending - Mix Slider*

*Layer Blending - Settings*

*Persistent*

*Style*

*Transformation*

*Blur*

*Sub Buffer Selection*

*Roto-Zoom*

#### Singing Faces

*Model definition*

*Coro Faces*

*Single Node*

*(Coro Faces)*

*Matrix*

*Node*

*Ranges*

*Timing Tracks*

*Using*

*Timing*

*Marks*

*Importing*

*Phrases*

*Breakdown*

*Phrases*

*Breakdown*

*Words*

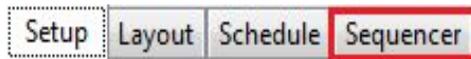
*Checking for*

*Unknown Words*

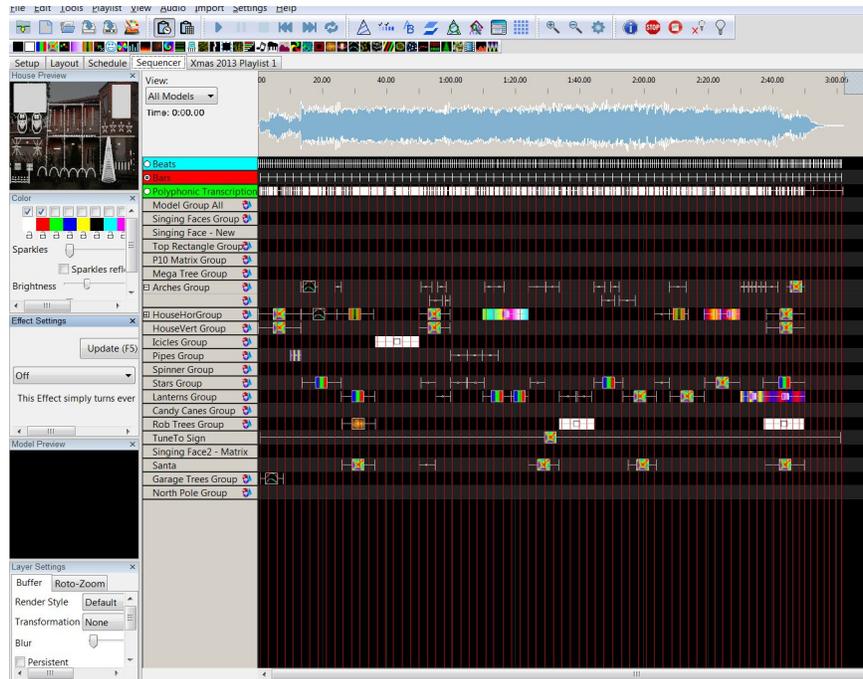
*Importing Papagayo Files*



## Sequencer



The sequencer is where the majority of time will be spent and where most of the functionality that the user sees resides. The main areas and functions of the Sequence tab are as follows:

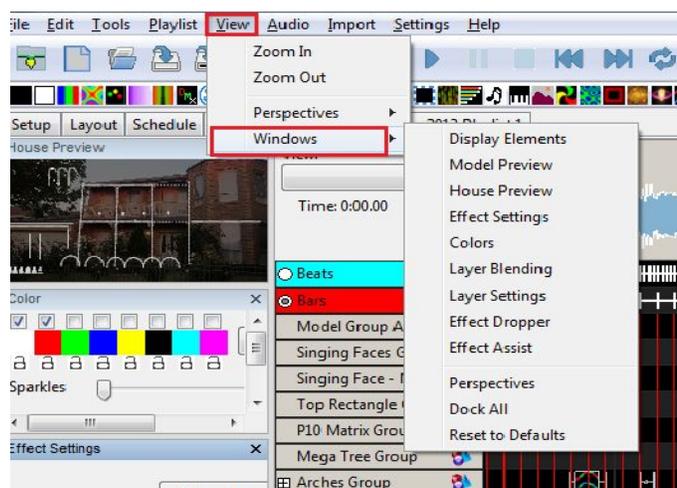


### Windows

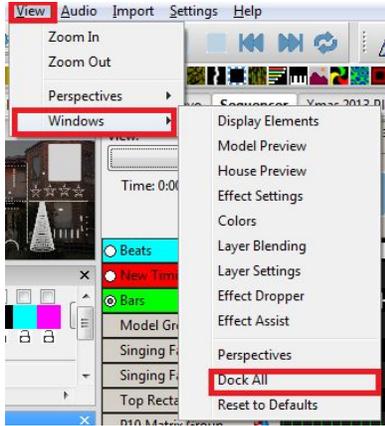
On the left hand side of the sequencer (or depending on how you have docked your windows), a list of open Windows are displayed.

To select additional Windows, click on View, Windows and select the windows that you wish to have displayed, if the window is not open.

You can close a Window or move them around or if you have an additional monitor configured, then one or more Windows can be moved to the alternate monitor. The Windows are described in the View, Windows section.



**Tip:** You can save the windows that you normally have open as your default perspective. These windows will then be opened when you load xLights.



Select the Dock All option to reset the Windows perspectives and dock all the windows to your current set-up.

This is sometimes required if you are using an xLights\_rgbeffects file that has been saved with a different default perspective e.g. two monitors and that set-up is not present in your current environment.

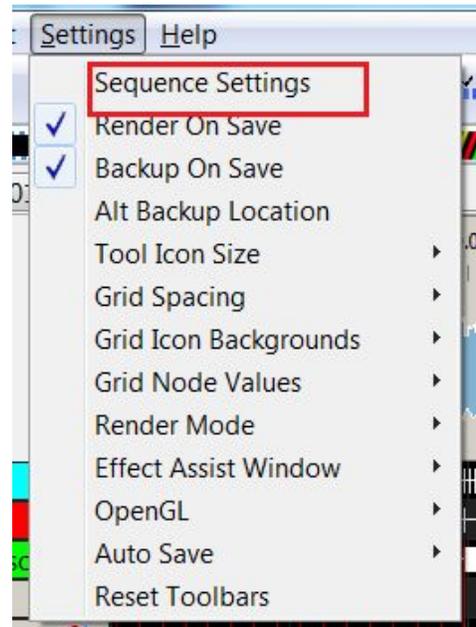
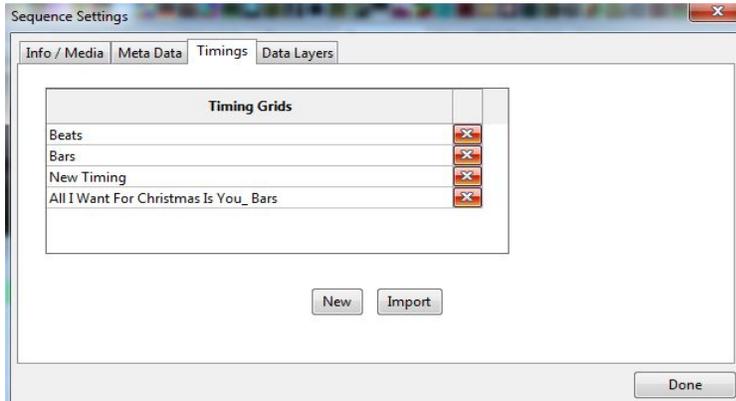
The Reset to Defaults options used to reset the Toolbars.

This will take effect when you next start xLights.

You must Save these settings for it to take effect - you will be prompted to save when quitting xLights.

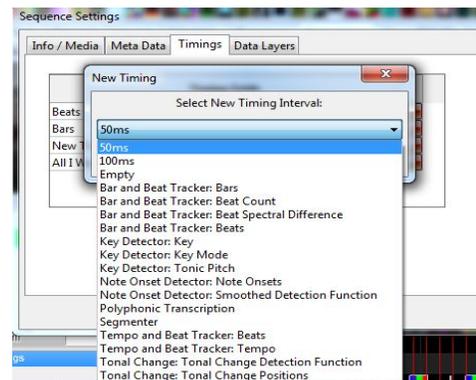
### Timing Tracks

xLights can support multiple timing tracks on the sequencer, each with different frequencies of timing marks. By default, a timing track 'New Timing' is created for each sequence if you have not created one when creating a new sequence. Timing Tracks can be added via the Settings, Sequence Settings, Timing menu.



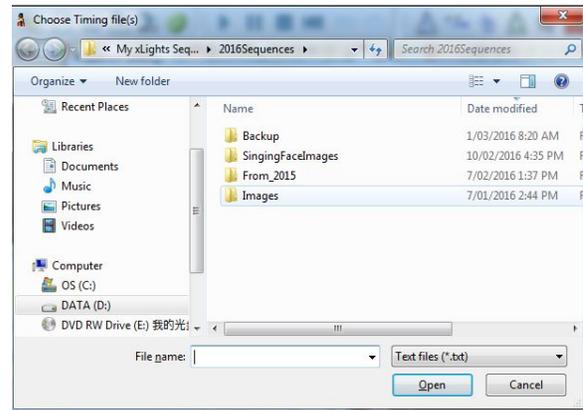
Then click on the New Button. The New Timing window will be displayed.

Clicking on the down arrow will provide a drop down list of timing intervals to select from to create a timing track. Other than the first three, the remaining are from the VAMP plugins. If you have not installed the plugins then they will not appear in the list.





You can also import a Timing track that has been created externally. Click on the Input button instead of the New button. A window Chose Timing files(s) window will open, enabling you to browse for and select the timing file to be imported. Navigate to the .txt file containing the timing track and click OK to import it.



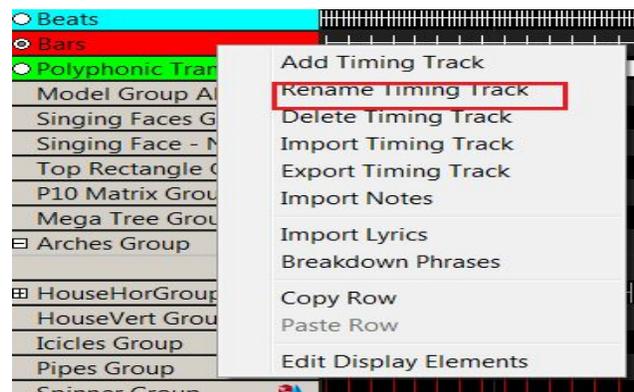
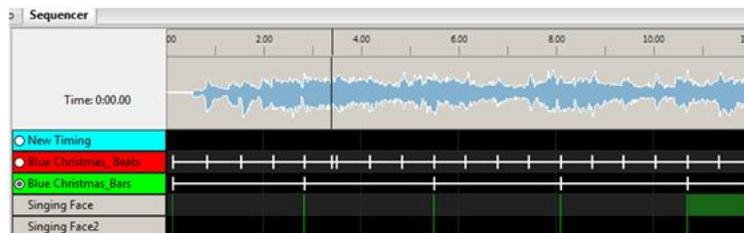
 **Note:** If you are trying to import a LOR timing grid and it is not retrieved i.e. the window is empty, use any xml supported editor and check the LMS xml file for a section called <timingGrids>. The section should contain a subsection called <timingGrid> which must contain an attribute called "type=freeform".

When you create a timing track it gets added to all views that you have defined. Timing tracks are local to a sequence.

 **Note:** The timing marks create a grid but once the effects are dropped they have no relation to the original timing marks that were used to drop them. You can switch to any other timing track and have a completely different grid.

If you have multiple timing tracks defined,

- Each timing track has a different color of timing marks.
- You can select the timing track radio button (to the left of the timing track name) to enable that track. You can also select more than one timing track to be displayed at the same time, however only one timing track will be active for effects to calculate the start and end position.
- You can rename a timing track , by right clicking on the timing track name and then providing a new name in the window that gets displayed.



You can set up timing marks on any timing track manually, by placing your cursor on the waveform (above the grid) and while playing the sequence, press the 't' key where you wish the timing mark to appear.



You can also have xLights create fixed timing interval timing tracks by selecting the Metronome timing option and then choosing the timing interval.

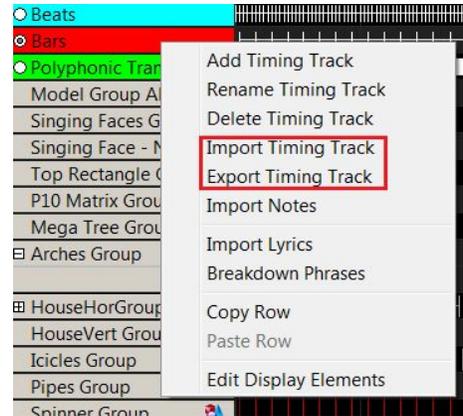
While on the sequencer tab, you can add new timing tracks or delete an existing timing track at any time.

Right Click , with your cursor in the area of the timing track names and select Add Timing Track or Delete Timing Track.



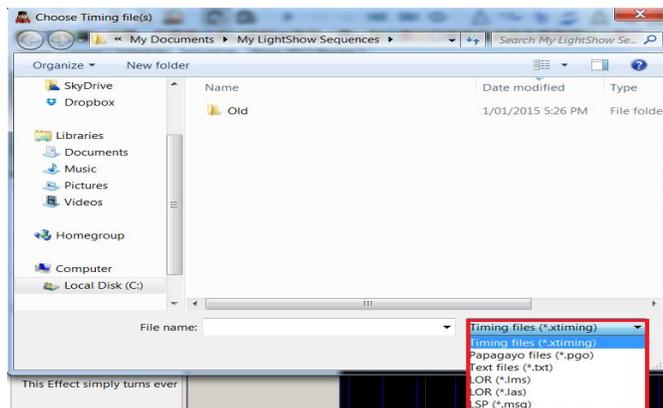
You can also import timing marks created externally (the most common being those created via Audacity or another xLights sequence).

This capability includes importing a Singing Face (xLights Papagayo) timing track.



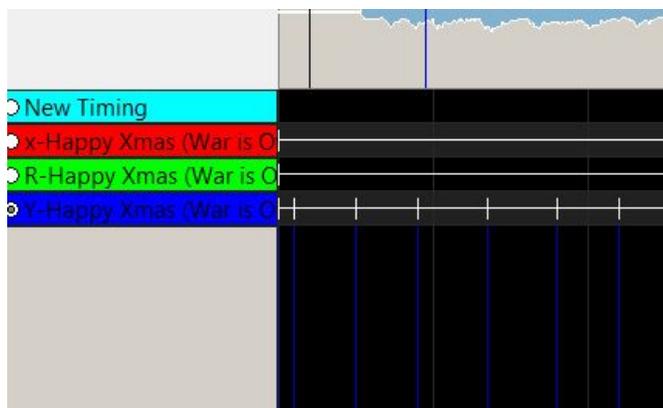
**Tip:** If you wish to select and delete multiple timing marks all at once, uncheck the circle beside the timing track and then drag select with the yellow dashed rectangle and hit the delete key.

In order to import a timing track, right click the Timing names area, then select Import Timing Track, navigate to the .txt ,PGO, LMS, LOR, LSP or .xtiming file containing the timing track and click OK to import it.



The timing tracks from the specified file are imported as xLights timing tracks - the following is an example of one that has been imported from LSP.

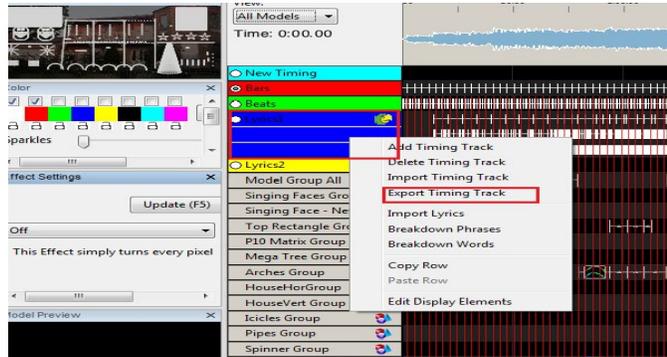
Importing of a PGO timing track is covered elsewhere in the document.



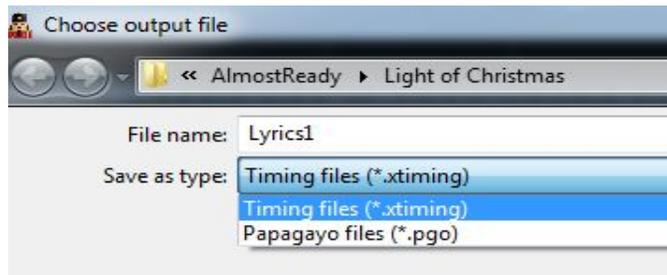


Similarly to export a timing track, right click on the timing track name in the Timing names area, and save as as .xtiming file.

This capability includes exporting a singing face (xLights Papagayo) timing track.



You can export the file as a PGO file , if you wish to provide the file for use in another type of sequencer (LOR ). If you wish to use this in for another xLights sequencer , then export as an xtiming file.

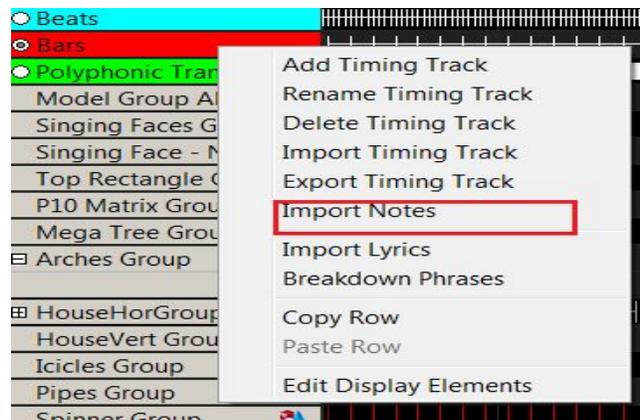


**Tip:** Timings are created just like effects which means they have a duration. Every timing effect has a starting edge and an ending edge. So you can have a timing effect that goes from 1 to 2 seconds and then another from 3 to 4 seconds with nothing in between 2 and 3 seconds. If you want one in there just select a range and hit "t" then drag the edges over to connect to the existing timing effects.

### Import Notes

The purpose of this function is to create a timing track by importing the notes from an external source such as a MIDI file, from an externally generated source such as Audacity or from a Music xml file.

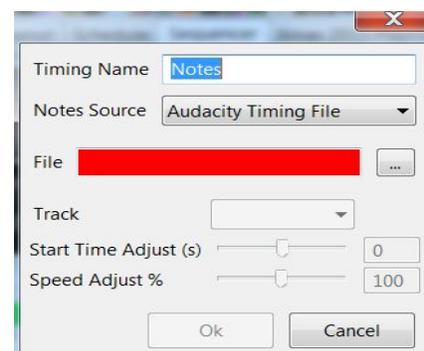
Right Click on the Timing Track name and select Import Notes.



Specify a name for the Timing Track to be created , the Notes Source, and then navigate to and select the file from which the notes are to be Import.

Click OK and the Timing track will be created from the notes.

Once the timing track that has been created , it can be edited or adjusted if required.





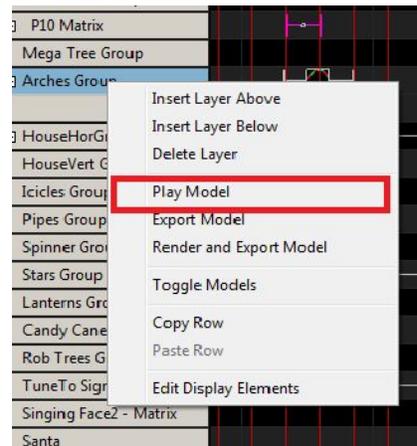
Subsequently, when using the Piano effect, specify the Timing Track that has been created as the Notes source.

## Models

### *Play Model*

If the Model Preview window is open, you can play the model effects in the window by right clicking to the left of the sequencer grid and selecting Play Model. The sequencer will start playing and the effects in this window will focus on the selected window

You can also achieve the same result by clicking on an effect against the model in the grid and then selecting Play.



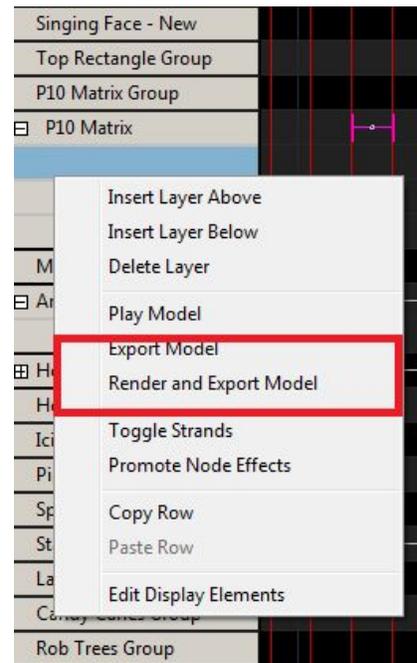
### *Export Model / Render and Export Model*

This function is used if you wish to export effects from your model to another sequencer, such as LOR, LSP, Vixen, HLS. It can also be used to export an eseq (effect sequence) to the Raspberry Pi Falcon Player (FPP). Effect files are .fseq format files with an .eseq extension. These special sequence files contain only the channels for a specific effect and always start at channel 1 in the sequence file. The actual starting channel offset for the Effect is specified when you run it or configure the Effect in an Event on the FPP.



**Tip:** Eseq (effect sequences) can be played on the FPP any time while a main fseq sequence is running and you can have as many effect sequences running as you want on different elements of your display. If you create an fseq called 'background.eseq' and upload to the FPP, it will execute as soon as the FPP has started i.e no definition is required on the FPP.

Right click to the left of the sequencer grid and select Export Model or Render and Export Model.

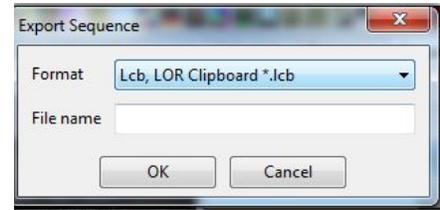


'Render and Export' renders the model to a clean buffer and thus would ONLY contain the data from the effects on that model.

'Export Model' could include data from other sources that may affect the model such as data layers, model groups, overlapping models.



You will then be presented with a window where you can select the target sequencer type and the filename to be created. Press OK when done.



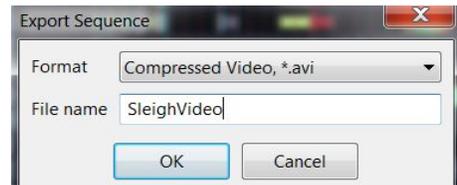
Status messages will be displayed on the last line of your sequencer as the model is exported. The file will be created in your show directory.



**Tip:** You can use this functionality to export a models effects to the Falcon Player and then use the effect to run a continuous background sequence such as a “Tune to” sign, independently of sequences running in via the fseq file.

### Model Export as Video

You can export your effects as a video avi file. It is limited to matrices trees and custom models. It generates a low res video which can be used in the video effect or in other sequencers. Right click against the Model name on the sequencer grid, select Export Sequence and then select either Compressed video or Uncompressed video. Enter the filename and press Ok. The avi file will be created in your show directory.



### Import Model

There is no functionality to directly import an xLights model that someone else has created (unless it is a custom model). However, since models are defined using xml, you can copy them into your xlights\_rgbeffects xml file in the models section. Then update the channel assignment to your setup.

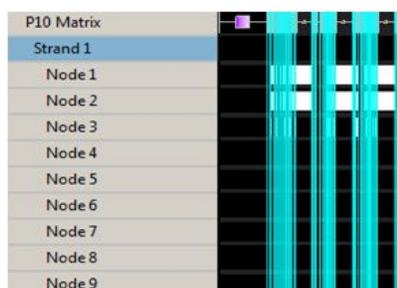
```
<xrgb>
  <models>
    <model name="Big Arch 1" DisplayAs="Arches" StringType="RGB Nodes" parm1="1" parm2="60" parm3="1" StartChannel="4" />
    <model DisplayAs="Arches" StringType="RGB Nodes" parm1="1" parm2="50" parm3="1" StartChannel="6484" StartSide="B" />
    ***** Insert new models here *****
  </models>
  <effects version="0004"/>
</xrgb>
```



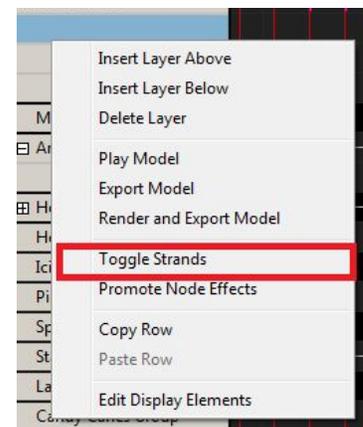
**Tip:** Use an editor that works well with XML. Notepad++ is a free editor than can be used. Ensure that after you paste the xml, that the </models> end tag is returned to its original position on a new line. If you leave that end tag at the end of the last model line, it won't work.

### Strands and Nodes

From the sequencer grid view, right click on a model name, and click on the Toggle Strands option, to display all strands for the model.



With the strands view open (i.e. displayed), right click on a strand to either toggle the strands closed or to Toggle Nodes and display the nodes for a strand.





This is often useful to see how a particular effect has been rendered down to the node level.



**Tip:** Dropping an effect on a Model group will give different results to dropping the same model on all elements of the group (because in the former case the canvas is treated as a whole matrix and then the effect is applied to the models within it). Some effects work at the Group level better than others.

On the left column of the sequencer tab, Model Groups have a symbol after the name that distinguishes them from Models.



**Tip:** When on the sequencer tab, If you right click on a Model group, the window will display a ‘Toggle Models’ option which will display all the models under the Model group (or hide them if you select the option again). You can also double click on the Model Group to obtain the same results.

### Render All



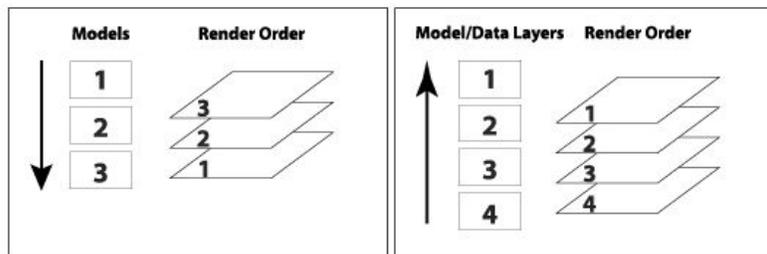
The ‘Render All’ function is used to force a render of all effects - that have either been created within xLights, imported via the Import Effects function or has been imported as a Data layer.

### Rendering order

The Data Layer order renders from the bottom to top. Therefore what is on the top layer will be done last – much like painting – the last brush strokes are on the top.

Model layers also render from the bottom to top. Therefore the bottom layer will be rendered first, then the layer above it and do on until the top layer is rendered last.

## Rendering Order (based on Master View)



However, the Models themselves render top to bottom based on how they are laid out in the Master View of the sequence. So the top model is rendered first, then the next lower model until the last model is reached.

This is important to keep in mind when you have multiple models or model groups mapped to the same channels such as whole house model group and regular models.



**Tip:** You can change the order of data layer by moving them up or down. You can similarly change the order of layers within a model. And you can also change the order of models in the master view.



**Tip:** Always put your large groups at the top. To view your rendering order you need to be in the Master View and it renders top to bottom. Use the display elements window to change the ordering.



Set the render order in the Master View and then use all my other views for sequencing. All other views don't affect rendering order they are for display purposes only.

### Timeline and Waveform

The top section of the display window is the Timeline section and indicates the scale that the waveform and sequencer is displaying.



You can select an area on the timeline – depicted by the arrows - and you can then play that section once independent of the section highlighted to be played on the waveform. At the end of playing that section, the highlighted arrows disappear, leaving the waveform highlight to be played. Clicking anywhere in the timeline or highlighting an area in the timeline initiates auto play, without losing the waveform selection.

The waveform displays a sonographic representation of the audio portion of the media that has been associated with the sequence.



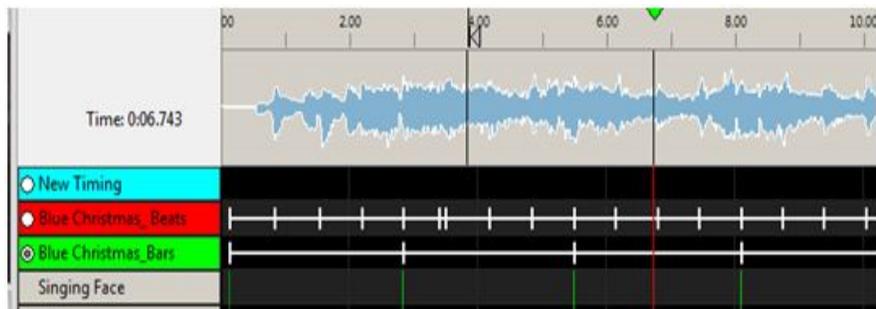
### Zoom in and Zoom out

You can control the focus of the waveform.

- Zoom in on the waveform by double clicking on the waveform. Keep double clicking until you've got a zoom setting you can use. Or click on the '+' button.



- To zoom out, hold the shift key and double click on the waveform or click on the '-'-button.
- Click the edge of an effect, hold down control and use the mouse scroll wheel to go in or out.



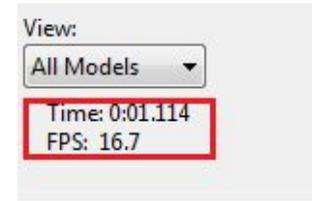
### Scroll Left/Right

Click on the waveform. Then hold down the Shift key and use the scroll key of the mouse to move the waveform and grid left or right.



When playing the sequence, a vertical line indicates the start position and another vertical line extending right through the grid indicates where the audio being played current is.

The time counter displays the time from the beginning of the sequence that the current position is up to. The FPS value displays the Frames Per Second that the sequence is outputting the data at.



You can highlight a range on the waveform to play only that section. If you move your cursor on the waveform towards either edge of the highlighted area, a 'hand' appears and you can use that to move the edge.

- If the Pause button is selected, and then pressed again, the sequence will restart from the current position that it stopped at.
- If after a Pause, if the Play button is pressed, then the sequence will restart from the marked 'start position'.
- Clicking on the Stop button will reset the start position to the beginning of the sequence.
- After Stop has been pressed the Rewind button will start from the beginning of the sequence and the fast forward button will play from the last component of the sequence.
- Highlighting a portion of the waveform will cause only that section to be played. Pressing the spacebar will replay that section.

- The 'Replay' button  will replay the highlighted section of the waveform. It will start from the beginning of the highlighted area and when it reaches the end of the area, will loop back to play from the beginning of that area.

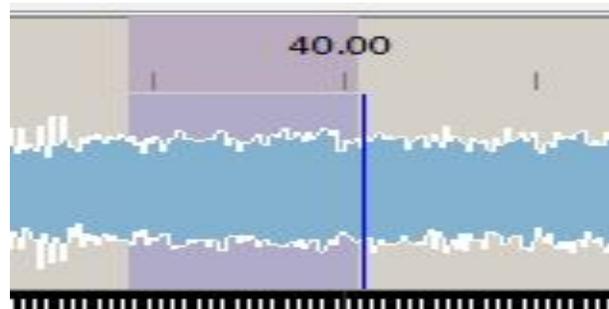
Clicking on an effect in the grid will not alter the waveform area that has been highlighted to be played. The effect becomes the focus point, if you zoom in and out, but the play range does not change. If you do want the start position to move to where your effect is, or to be based on the edit position in the grid, then double click in the grid and that will then remove any highlighted position/area in the waveform and set the start position in line with where you have double clicked.

To scroll Left/ Right, click in the grid. Then hold down the Shift key and use the scroll key of the mouse to move the grid left or right.

### *Audio Scrubbing*

Hold the Ctrl key down and placing the mouse on the waveform, click and hold the mouse left button down and drag it across the waveform.

The audio will be played as you scrub the line. Therefore you can play a small section again and again, backwards and forwards so as to identify a particular note inflection, timing mark or a word of a lyric.

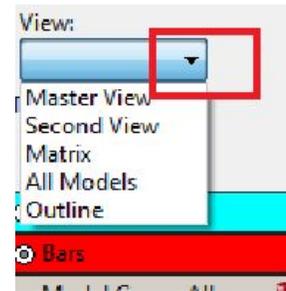




## Views

A view is used to be able to easily select a list of models and the sequence in which they are to be displayed on the sequencer.

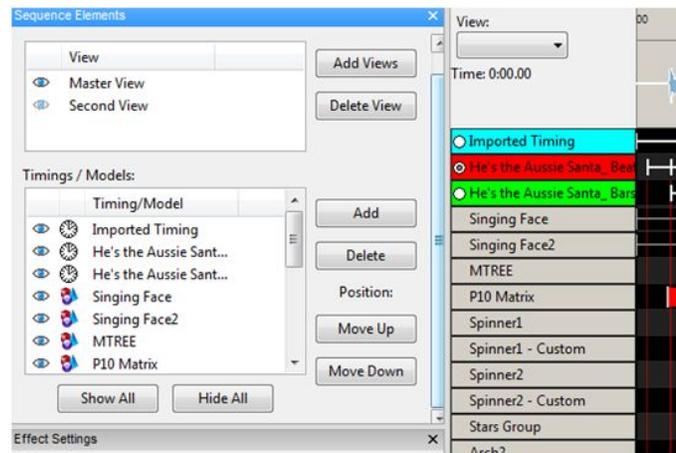
Views work across sequences, so once you have setup a view with the models that you require, if you open any sequence, that view is available to use in that sequence.



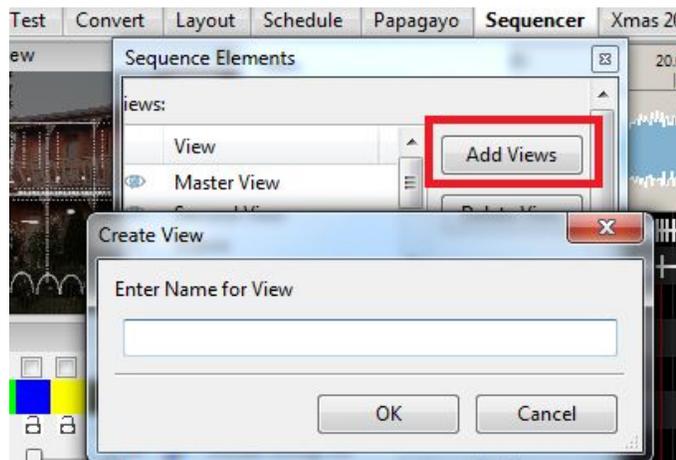
**Tip:** If you define Model Groups in a view, then when you use the view in the sequencer, you will be presented with a list of the groups. Double Clicking each group will open up the list of models within the group.

Multiple views can be defined, with each view defining a list of models that are to be displayed and the sequence that they should be displayed in. For example:

- A 'Static Model' view may contain all elements that are non RGB.
- An 'Import Model' view may contain only elements that you wish to sequence after importing other data from other sequencers.
- A 'Halloween Model' view may contain only elements that you wish to sequence for Halloween.

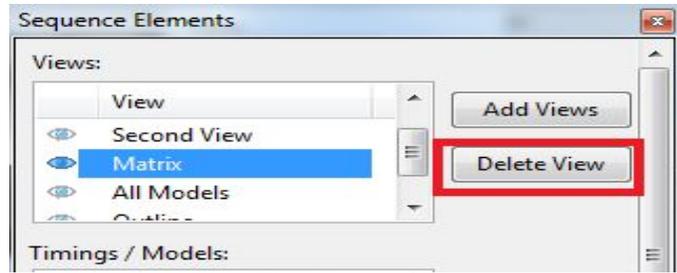


To Create a new View , click on the Add Views button, enter a unique name in the window and Click Ok.

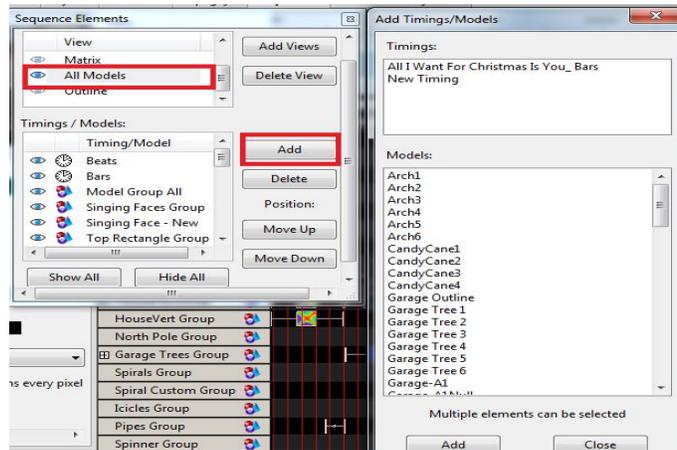




To delete an existing view, highlight the view from the View window and select Delete View

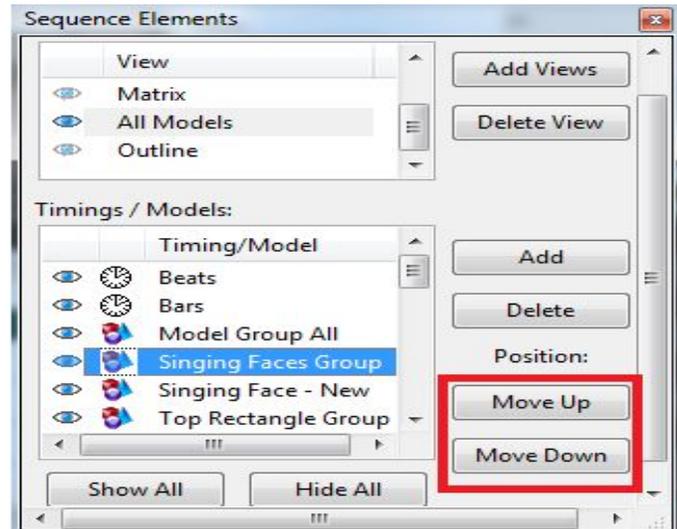


New models can be added to a view by selecting that view from the Views window within the Sequence Elements window (or from the View window to the left of the Waveform) and clicking on Add Models.



Similarly models can be removed from a View by highlighting the model in the Model window within the Sequence Elements window and clicking on Delete Model.

The position that the model appears within the view can be changed by highlighting the model and clicking on Move Up or Move Down.



Within each view, the models that are part of the view can be marked as visible or non visible via the  button to the left of the model.



**Note:** The visibility is across all sequences and not specific to the sequence that is open. So if you make a model non visible, it will become non visible in all sequences.

The **Master View** is a special (system created) view. It contains all the models that have been defined for the sequence that is open only i.e. it does not span sequences. It also determines the rendering order. Any model added to any other view when a sequence is open automatically gets reflected in the Master View of that sequence. Models can be deleted (i.e. removed) from any view at any time.



**Note:** If you attempt to delete a model from the Master View, you will be prompted to confirm the deletion, as deleting the model from the Master View will remove all effects that you have created against that model for the sequence that you have open.



If you add a Timing Track to a view, it will be added to all views that you have defined.

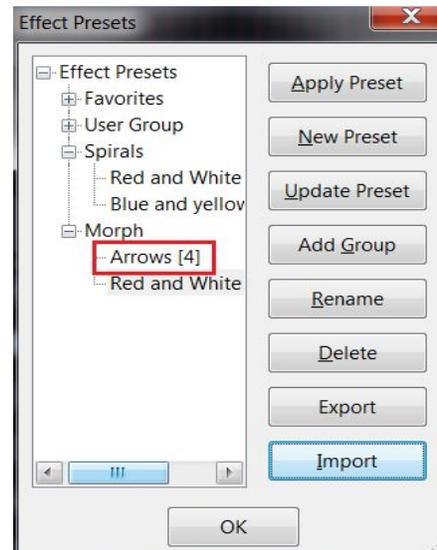
### Effect Presets

Presets are a way to save an effect and easily recall it later to speed up sequencing.

You can also send snippets of your effects to other people and import and use snippets of effects supplied by other people without having to import an entire model.

The Effect Presets window enables presets to be managed. You can group them and perform a number of actions.

Against each preset name, the count of the number of effect layers is displayed.



#### *New Preset*

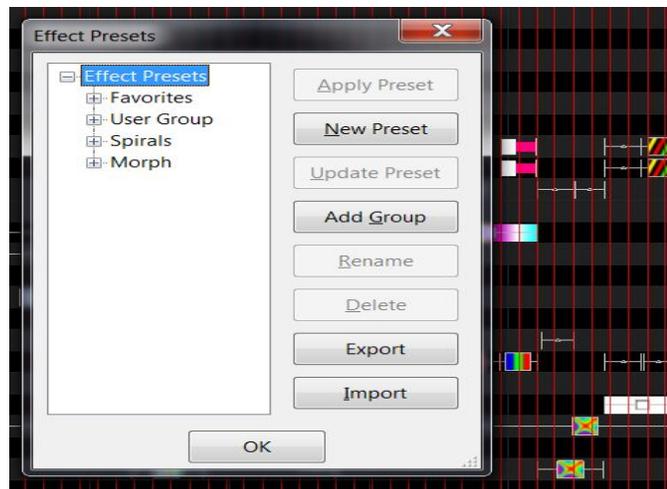
To save an effect (which can span layers and models) as a preset, highlight the effects that you want to save, right click and select Effect Presets. Under the Favorites tree, you can first create a group that describes the type of effect that you are going to save (Spirals, Bars, etc). Click on Add group and give the group a name ('Spirals'). Then select the group and click New Preset and give the Preset name ('Red and White Spirals') and press OK.

#### *Retrieve Preset / Apply Preset*

To retrieve a preset that has been saved, go to a location on the grid where you wish the preset to be placed, right click on the sequencing grid, select Effects Preset, scroll to and locate the preset you want and double click on it to have it copied to your location, or select Apply Effect.

#### *Updating a Preset*

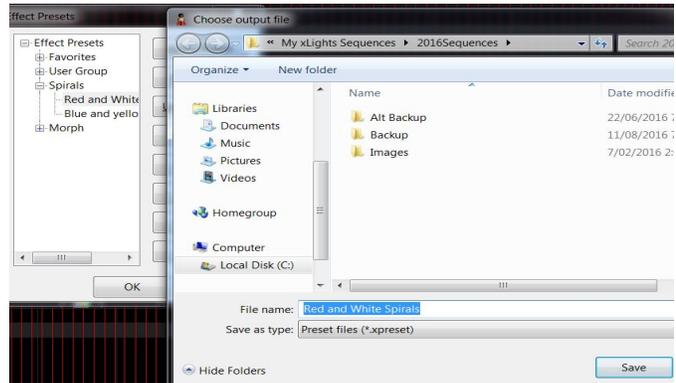
If you change something within an effect preset that you have selected, you can update it by clicking Update Preset.





### Export Preset

To export a preset, select the Preset name from the list in the Preset panel, then click on Export preset. Specify a name and click on Save. A file with the selected name and a '.xpreset' suffix will be created.



### Import Presets

To import a preset, click on Import Preset, browse to where the '.xpreset' file is located, select it and then click on Open. A preset will be created under the highlighted group with the name of the selected file.

### Maintaining Presets

You can move an effect preset from one group to another group by dragging it across from one group to another. You can also highlight the name and delete it or rename it.

### Adding an Effect

Click on the effect from the effects toolbar and drag the effect to the grid and release it between two timing marks on the row of the model you wish the effect to play on. You can then select and drag each end to stretch the duration of the effect or reduce the duration of the effect. The effect that you are working with is reflected in the (associated and open) windows to the left of the grid.

If no timing track is selected then you can drag and drop even if you have no timing marks but the effect defaults to 1 second long.

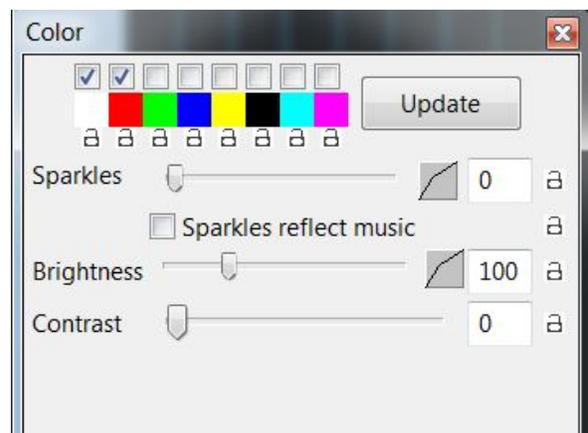


**Tip:** Select and open the Views, Window menu and select windows to be opened.

### Changing an Effect

From the Color window, you can change the Colors that apply to the effect, as well as the Sparkles, Brightness and Contrast values. How effects use the colours is defined by the effect. Some support just one, some support up to 8.

Use the Sparkles slider to increase the sparkles for the effect. If the Sparkles reflect music option is selected, then the sparkles will increase from the selected value based on the intensity of the music.



Use the Brightness slider to increase or decrease the brightness of the effect.





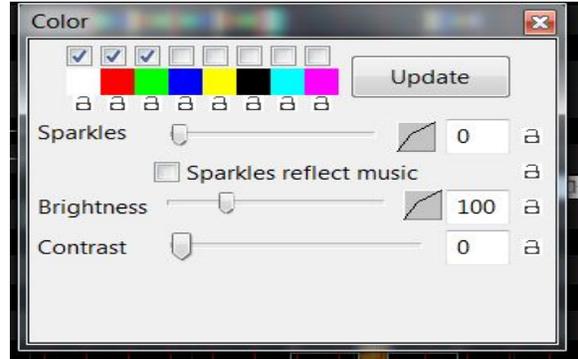
**Tip:** if this window is not open, select and open the Window from the Views, Window menu. You can save all your window positions as a “Perspective” for easy recall.

*Color Curves*

This functionally enables a color to change within an effect duration ie where previously the same color value would have been displayed for a particular segment duration it can now be made to change within that segment duration.

As an example , drop a Bars effect against a model on the grid.

After selecting the required colors (white, red and green in this example), right click on the first color .

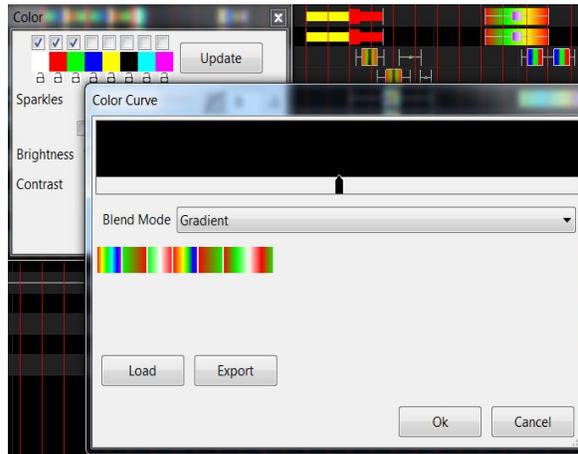


The Color Curves window is displayed.

The window representing the Color curve is black in color.

Double click on the mark (which turns yellow to indicate it has been selected) and from the resulting Palette window select a color (White).

Move the marker to the far left. Then click within the White Color curve window. This creates another mark , Double click on that mark and select Blue as a Color.

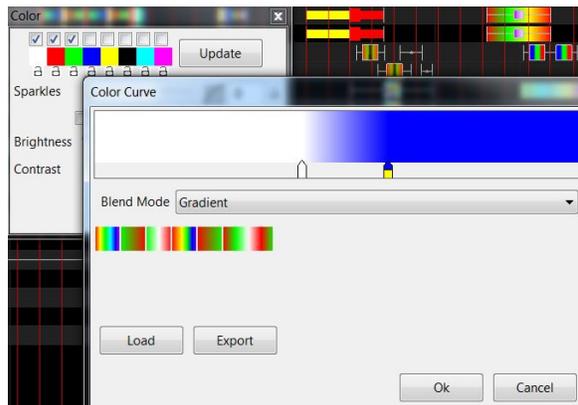


You now have a color effect that starts White and Turns blue over the duration of the effect.

You can adjust the markers to control where the color changes.

You can have up to 40 different color changes.

The Blend Mode can be set to Gradient or None (sharp change).



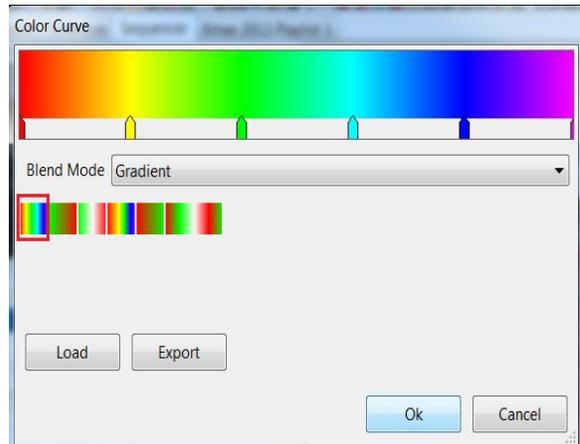


For effects that have the Palette color option (such as the Butterfly), the Palette must be selected for the colors to come into play.

You can select any one of the color curves present just below the Blend Mode attribute by clicking on it.

The color curve values will be copied into the window just above and you can then use the markers to adjust the color.

To can export a color curve by clicking on the Export button. You will be prompted to specify a name for the Color curve and a .xcc file of the specified name will be created in the location specified.



Similarly you can load a previously exported color curve file by clicking on the load button and then navigating to the location of a .xcc file and selecting it.

This functionality works on most effects but not all. For example – it is not applicable to effects such as DMX, Faces, Fire, Glediator, Pictures, State and Video.

### *Selecting Colors*

From the Effect Settings window, you can change various options/attributes that are applied to the effect.

For any effect, you can change the initial colors selected for the effect by selecting a different color or colors from the Color Window. You can use the Control key and select multiple effects.

Once you select all the effects and change the color , hit the Update button in the color panel. It will modify just the colors for all selected effects.

You can open/close the Color Window by Clicking on the Effect Colors icon in the toolbar.



**Tip:** Clicking on the any of the color icons opens up a Palette window, where the standard colors can then be replaced with a new standard color or a custom color can be selected.



**Tip:** One you tailor an effect then use the effect again to a new timing mark, the effect will have all the same settings as the previous effect did. For most of the effects, however, the colors will reset when the effect is selected again.

### *Single Channel Colors*

Single Channel colors react only to the color that they are defined as. If you define them as single color blue then it will only react to the blue channel. You can set any color and it will route the blue portion of that color to that model.



If you send White (R=255, G=255 B=255), to a single color blue model then it will turn fully blue. If you send blue it will turn fully blue. If you send red or green it won't turn on at all. If you send pink which is R=255, G=0, B=128 you will get a half brightness blue.

You can therefore include those single color models inside a group and they will react to the colors dropped on the group. Any of the "blue" components of the RGB values assigned to that model will cause it to fire at the associated brightness of the component.

The strings will light up with the intensity of the color for each channel. So if you send Purple R=128, G=0, B=128), that will light up all the Red and Blue strings but only about 50% intensity.



**Tip:** If you just want a string to turn on full brightness without worrying about it then use White.

### Moving and Stretching effects

A single effect can be moved about on the sequencer horizontally, by selecting it with the mouse and dragging it left or right. A timing grid must be active. You can also select the effect and use the Left or Right arrow keys to move it left or right. When the effect encounters or is blocked by another effect, if you keep going, it will jump over the effect/effects and continue past.

Similarly an effect can also be moved vertically from one model to another. Use the Up or Down arrow keys to move it up or down. When the effect encounters or is blocked by another effect, if you keep going, it will jump over the effect/effects and continue past.

An effect or group of effects can be moved, by highlighting the effect, or range and moving it along the same model row/rows on the grid forwards or backwards. Hold the **Shift** key to move multiple effects.

Multiple effects can also be moved by using the Cntrl key. Click on the first effect, then hold down the Cntrl key and click on other effects. Then use the arrow keys (Up, Down, Left, Right) to move the selected effects together in the required direction.



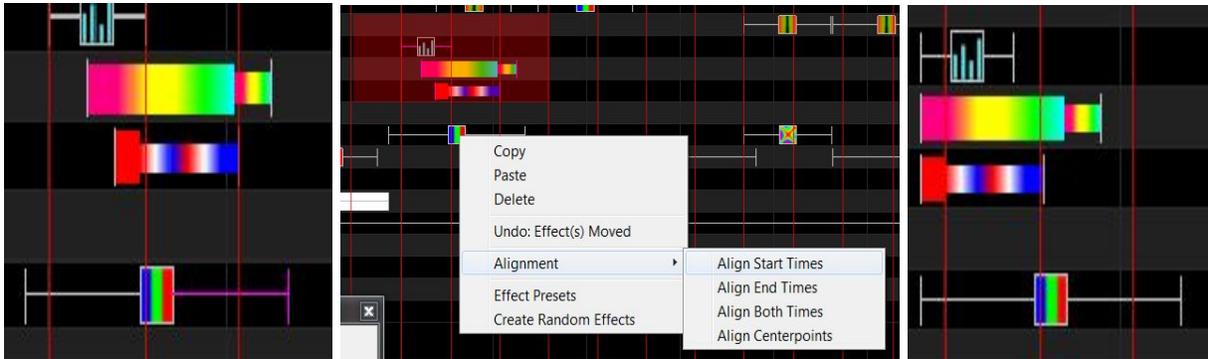
**Tip:** Effects can be stretched by using the **Alt** key and dragging one edge of the effect highlighted (most commonly the bottom right corner) to provide a Chase effect. You may need to use Toggle Nodes to view the nodes so as to be able to stretch an effect.



**Tip:** A simple way to do a chase effect is to select a block of cells and hit 'd' for a fade down or 'u' for a fade up. If you then need to adjust it, drag the end line.

### Aligning effects

In order to align several effects to the same start or end times, drag a box around all the effects you want to align and then hold down shift and click the effect you want to be the reference. Then right click and select Alignment. You can then select one of the four options to align to the effect you selected as your reference. In the example below, the Start times of three effects have been aligned to the Start of the Bar effect just below them.



You can even select a timing effect as the reference and it will align to that timing effect.

### Copy, Paste, Delete Effects

In order to copy and paste an effect, select the individual effect, right click and then select Copy. Move the cursor to where you want the effect to be copied to, right click and select Paste. You can also press Ctrl+C and Ctrl+V to copy and paste the effect.

In order to copy and paste a range of effects, use the cursor to highlight and select a range of cells. Then copy, followed by paste.

You can paste what is in the buffer (after a Copy) to multiple locations, by moving the cursor to each new location and pasting the copied data (right click and Paste or Ctrl+V) there.

There are two modes for Copying and Pasting effects: Paste by Time or Paste by Cell.

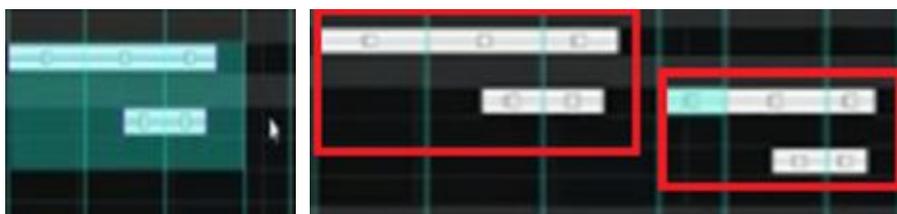


You can select, or change the mode by clicking on one of the two icons.

Paste by Time is the most common option. You do not need to have a timing track active. You copy the required section and paste at the required location. The copy works on copying effects and not copying grid locations. Therefore it will copy the first effect from within the range highlighted, and accordingly will paste that effect (and others after it that were selected) at the grid location when Paste is selected.

Paste by Cell works using timing tracks. A timing track must be active when you copy, so that the cells to be copied can be determined from the active timing track. You can use this option to copy timings/timing data (such as the phonemes used for singing faces).

You can use this option to paste effects to cells of a different size to the cells you copied from. If the source cell was a full cell, then the target cells will be filled. If the source cell was  $\frac{1}{2}$  filled, then the target cell will also be  $\frac{1}{2}$  filled ie it will be pasted to the same proportion as the source cell.





## Examples

1. You copy a single effect, select a target cell and hit Paste with Paste by Time mode. The result is the effect is pasted with the original duration. So if the original duration was 2 seconds, then two seconds duration will be pasted in the target irrespective of the length of the cells..
2. You copy a single effect, select a target cell and hit Paste with Paste by Cell mode. The result is the effect is pasted to fit within the target selected cell based on a %.

If it was 100% of the source cell, then the full target cell will be covered.

If it was 50% of the source cell, then 50% of the target will be selected.

You can delete an effect, by selecting the effect in the grid and pressing delete on your keyboard or pressing Ctrl+-X.

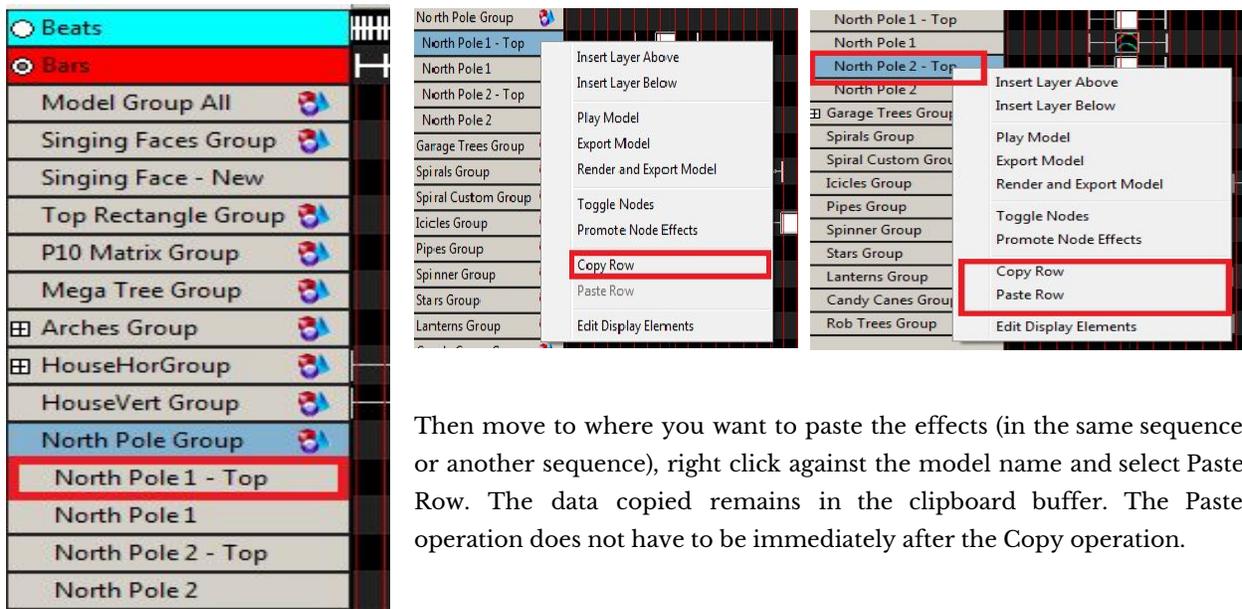


**Tip:** In order to delete multiple effects, use the left mouse key to highlight a range of cells and then press delete. You can also right click on an effect and choose delete.

## Copy Row

You can copy the effects of an entire row and paste it to another location (i.e. against a different model).

Highlight the model name, right click and select Copy Row to copy the entire row of the effects.



Then move to where you want to paste the effects (in the same sequence or another sequence), right click against the model name and select Paste Row. The data copied remains in the clipboard buffer. The Paste operation does not have to be immediately after the Copy operation.



**Note:** The Copy and Paste operations work at the row level. The Model name that is selected is only used to identify the row. The operation does not work at the Model or Model Group level.

## Undo Effect

Many, but not all effect actions can be 'Undone' by right clicking on the Grid and selecting the Undo action i.e. Undo effect move or Undo delete.. etc

You can also use the shortcut key of Ctrl+Z. The Undo actions can be daisy changed i.e. they can be repeated one after another.

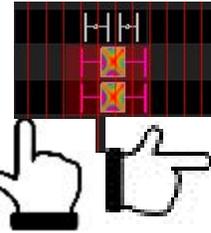


### Selecting Multiple Effects

In order to select a group of effects, use the left mouse key to select the range of effects. The colour of the cells change, but also, the links in the selected cells will turn to magenta.

You can only select a group of cells, when the cursor looks like a pointing hand.

If two arrows are shown, then you can't select the cells. You may need to zoom in to be able to see and select the required effects.

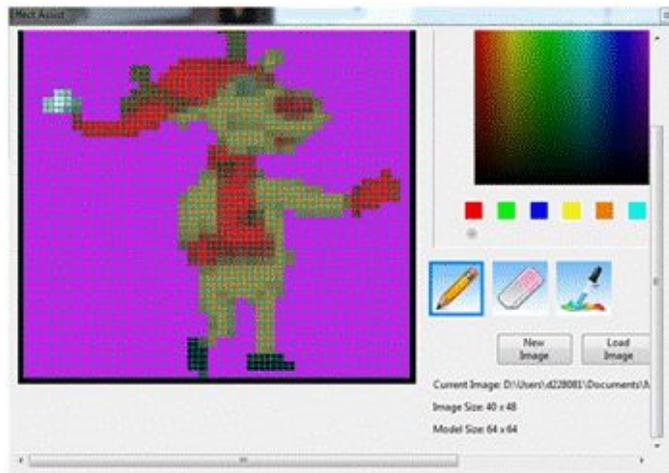


### Create Random Effects

Select and highlight an area on the grid. Right click and select the option to Create Random effects. Effects will be randomly selected (along with different colors and options) and effects created in the area highlighted, each between consecutive timing marks. If there are no timing marks active, then a default time value will be used for each effect. You can also use the shortcut key 'R' to achieve the same result by highlighting one or more cells and pressing R.

### Pixel Editor (Matrix Drawing Tool)

You can use the Matrix drawing tools to amend a picture or draw your own pictures or animations. Click on the Picture effect within the sequence grid that contains your effect and then open the Effect Assist window if it is not already open. You will be presented with a window similar to the following i.e. the picture of your effect is copied to a grid.



The Matrix Drawing Tool has 8 windows, each with a color and a radio button under the color to show you which color is selected. You can change the color assigned to each window, change the saturation, hue, brightness, change the RGB setting etc.

Select the pencil tool and after selecting a color, use the left mouse button to draw and fill in the selected color or use the right mouse button to erase what has been drawn. The eraser can be used to remove colors on the grid.

#### *New Image*

Click on New Image to create a new image. The first time you use this function, you will be prompted for a directory to store the image files in. As an example, create an 'image' subdirectory within your show directory. You will be presented with an empty grid and you can then draw/paint your effect within the grid. Click on Save image and name the image. The model window will display the model just drawn. (The model won't be updated until the file is saved).

#### *Load Image*

Load Image is used to load a previously saved image or any other supported image. If the picture loaded is not as per the model scale, you won't be able to edit it.

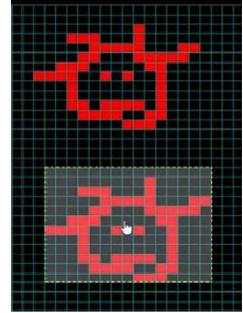


### Save As

Save As can be used to save an effect to a new name.

### Copy / Paste

Highlight the area that you wish to copy, press Ctrl C to copy to the clipboard buffer, move to the area that you wish and press Ctrl V to paste it.



### Playing a Movie as an effect



**Tip:** This section has been retained for historical reasons. A better way to play a movie as an effect is to use the Video effect and play an mp4, mpg, avi, mov, flv, mkv, or .as file .

You can play an mp4 movie on a model such as a matrix or a whole house using the picture effect. Create a temporary directory, and copy the movie file there. Then use the 'ffmpeg' utility to break it up into frames.

### Windows

ffmpeg is run from the DOS command line.

Example:

```
C:\
cd \tempdir
ffmpeg -i yourmovie.mp4 -s 30x50 f-%d.png
```

This will create a number of files 'f1-' onwards ie frames f-1.png, f-2.png .etc. Your original movie has been resized to 30x50 pixels.

Drop the picture effect and browse and point to the first file ie "f-1.png", using the pictures effect. The picture effect will then pick all the frames.



**Note:** Only 'something-1' will work ie the application looks for the '-1' and then only picks the others.

If you have an entire movie saved, you can export just portions of the video file as follows:

```
ffmpeg i yourfile.avi s 30x50 ss 00:00:00 t 00:03:00 movie1% d.png
```

This will make a 3 minute capture starting at the beginning. The time is noted in hours:min:sec.



**Tip:** A quick way is to navigate to the directory with the video file using Windows Explorer. Then make sure no files are selected and hold down SHIFT and right click and you should get an option for "Open command window here". Now you have a DOS prompt already in the right directory without having to type all the commands to get there. You won't get the right options if something is highlighted.

### Macintosh

This has been supplied from and is based on the following :

<https://trac.ffmpeg.org/wiki/CompilationGuide/MacOSX>



1. Download Homebrew following these instructions <http://brew.sh>

```
Travis — bash — 80x24
Last login: Sat Oct 31 08:12:23 on ttys000
iMac-3:~ Travis$ ruby -e "$(curl -fsSL https://raw.githubusercontent.com/Homebrew/install/master/install)"
```

2. When prompted install the developer tools

3. Install FFmpeg from Terminal

- Copy this: `brew install ffmpeg --with-fdk-aac --with-ffplay --with-freetype --with-libass --with-libquvi --with-libvorbis --with-libvpx --with-opus --with-x265`
- Install additional items if desired

```
FFmpeg has been built without libfaac for licensing reasons;
libvo-aacenc is used by default.
To install with libfaac, you can:
  brew reinstall ffmpeg --with-faac

You can also use the experimental FFmpeg encoder, libfdk-aac, or
libvo_aacenc to encode AAC audio:
  ffmpeg -i input.wav -c:a aac -strict experimental output.m4a
Or:
  brew reinstall ffmpeg --with-fdk-aac
  ffmpeg -i input.wav -c:a libfdk_aac output.m4a
```

After installation you can begin using FFmpeg.

While in terminal navigate to the folder that contains the video file. You can easily navigate to the folder by typing CD and then dragging it into Terminal and the folder path will be displayed.

```
American_Flag — bash — 80x24
Last login: Sat Oct 31 08:11:40 on ttys000
iMac-3:~ Travis$ cd /Users/Travis/Documents/Christmas\ Lights/P10/American_Flag
iMac-3:American_Flag Travis$
```

Enter the command to convert the file.

```
ffmpeg -i "American Flag.mov" -r 20 -s 96x48 -ss 00:00:00 -t 00:00:00 s-%d.png
```

- The `-r 20` is the frame rate.
- The `-s 96x48` is the resolution of the output file and should match your matrix. In this example, 96 pixels wide and 48 high. This is a P10 panel matrix of 9 panels in a 3x3 configuration.
- The `-ss 00:00:00 -t 00:00:00` specifies the time you want to extract from the video. If you want the entire video when do not use this setting.

### Shortcuts

There are a number of shortcut keys that can be used for functionality or adding effects on the grid. These effects are stored in the `xlights_keybindings.xml` file and can be modified by the user. Note that you must edit this file while xLights is **NOT** running. Changes will be lost when xLights closes as this file is saved upon exit each time.

Key	Type	Function
t	Timing Add	Adds a timing mark to the currently selected position.
s	Timing Split	Splits the current timing mark in half



+	Zoom In	Also available by the Control+mouse wheel
-	Zoom Out	Also available by Control+mouse wheel
R	Random	Generate Random effects

Key	Type	Effect	Key	Type	Effect
o	Effect	On	f	Effect	Fire
O	Effect	Off	F	Effect	Fan
u	Effect	On - Fade Up	g	Effect	Garlands
d	Effect	On - Fade Down	p	Effect	Pinwheel
m	Effect	Morph	r	Effect	Ripple
c	Effect	Curtain	x	Effect	Text
i	Effect	Circles	s	Effect	Spirals
b	Effect	Bars	w	Effect	Color Wash
y	Effect	Butterfly	n	Effect	Snowflakes

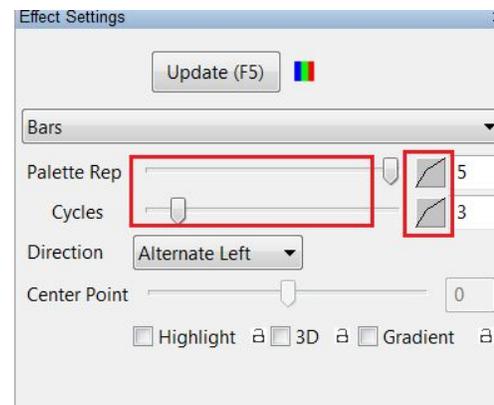


**Tip:** The On and Ramp Up/Down effects also enables the intensity to be defined as a shortcut key. Look at examples in the existing file which has a start intensity set to zero and end intensity set to 100%.

### Value Curves

The Value Curves functionality effectively changes the way an “effect” or setting works over time in a non linear fashion , based on the type of Value Curve selected and other parameters off the curve. This is best explained via an example.

Consider the Bars effect. It has two attributes ‘Palette Rep’ and ‘Cycles’ that can be linearly adjusted using the sliders. They are currently set to 5 and 3 respectively. This means that the palette will repeat 5 times over the duration of the effect and the effect will cycle through three times. Both will be applied evenly across the duration.





However , if you click on the Value Curve icon for either of these attributes , you will be presented with options to change how these repetitions are applied .

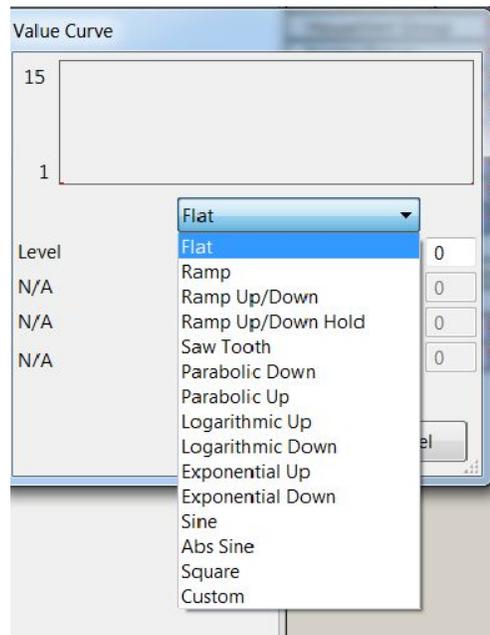
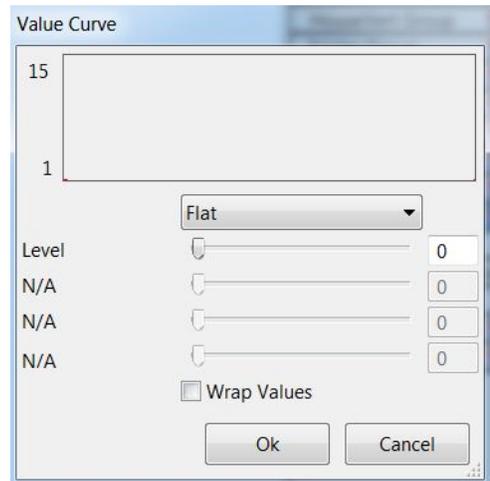
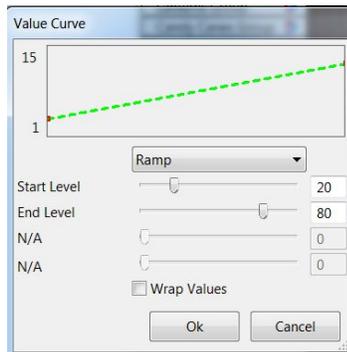
The Flat option is the same as the default linear option. The level can be used to adjust the intensity.

The other sliders are labelled 'N/A' as they are not applicable to the context and type of Value Curve thats is being used.

In other scenarios, Value Curves and for other effects , different sliders are available.

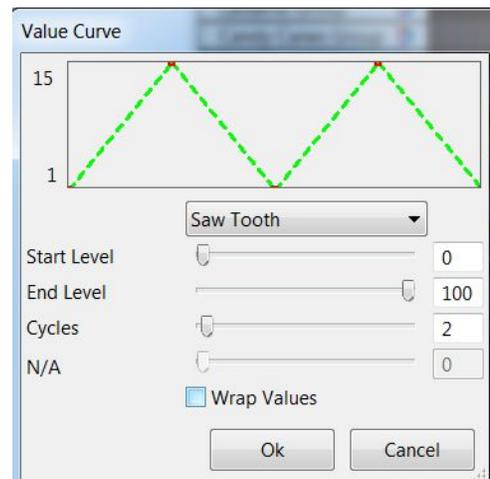
Click on the drop down link and a number of options are presented.

Select the Ramp Value curve. As the image indicates, this will cause the selected attribute (say Palette Reps), to increase (ramp up) over time , starting from 20 % and ending at 80%. Note that the Start level and End level sliders are now active.



Another type of Value Curve is the Saw Tooth variation. The selected attribute to which this is being applied (palette reps) will increase and decrease twice (controlled by the Cycles selected) from a start level to and End level.

To disable a value curve click it again and the slider will be available again. To edit a value curve click it to disable it then click it again to enable it and edit the values.





## Layers

Layering effects gives you the ability to create unlimited stunning effects that could not be created without layers.

First, let's go over the limits. Each model may have a up to 200 layers of effects. Each layer can be mixed 12 different ways with the layer below it for a combination of thousands possibilities within a single timing cell.

Usually 4-6 layers is plenty enough though for the most discriminating user depending on the model shape and size. Why would you even want multiple layers on a model?

Layers on a model are like layers on a cake. Each layer adds a bit to the effect produced at the end. Much like layering your popcorn with butter or salt. It's easy to think of each layer of being additive like a food recipe, but you can also use layers to be subtractive as well using layer masks to reveal only a portion of a layer. See the table below for the different layer blending options.

Think of a color wash in red, with a layer of snowflakes. Normally you would picture a red model with the white snowflakes. You could change the layer masking so that the model was black and showed red on the snowflakes. Some effects like Morph can be applied to only a portion of a model, so using layers you can get multiple morphs on a Mega Tree that look like interleaving fingers for example.

Combining two spirals in opposing directions on a mega tree also can create stunning effects.

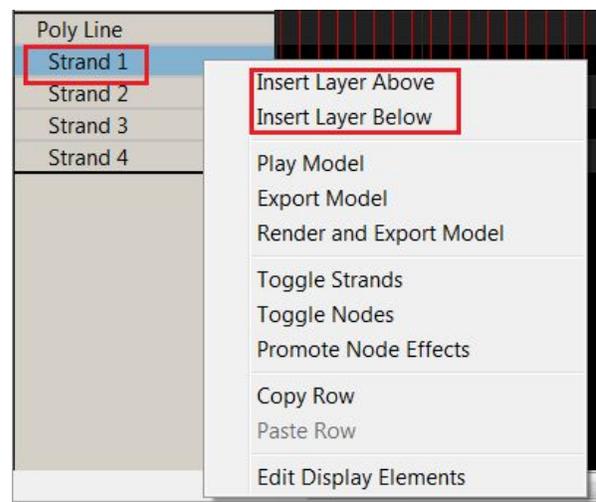
To add layers to a model right click the model in the sequencer tab and choose Add Layer above or below (the current layer).

Layers can also be added at the Strand level.

The Poly Line model defines each segment as a Strand and the layer functionality can then be applied separately to each strand.

To add layers at the strand level, click on the Model name in the sequencer to display the Strand names. Then right click on the strand name and choose Add Layer above or below the selected strand.

The strands blend onto the model level effects.





### Layer Blending

The Layer Blendings window can be opened by clicking on the Layer Blendings icon from the toolbar or via the View , Windows menus.



When setting the layer blending modes, the current layer is considered layer 1 and the layer below is considered layer 2.

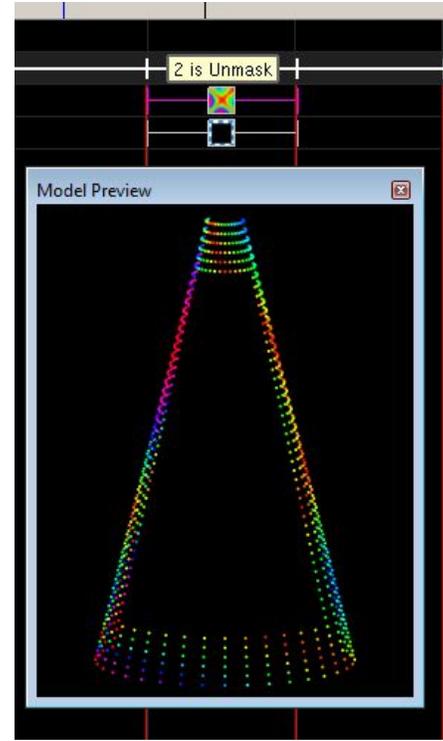
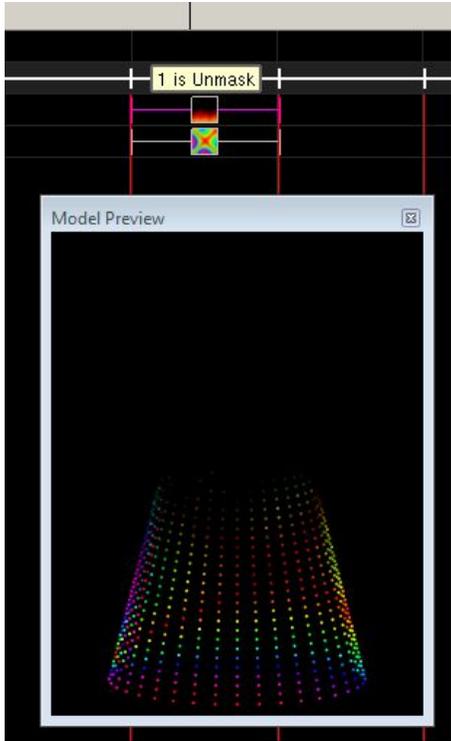
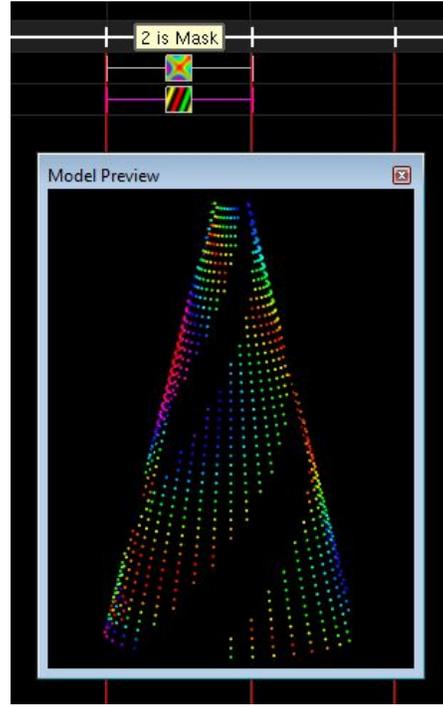
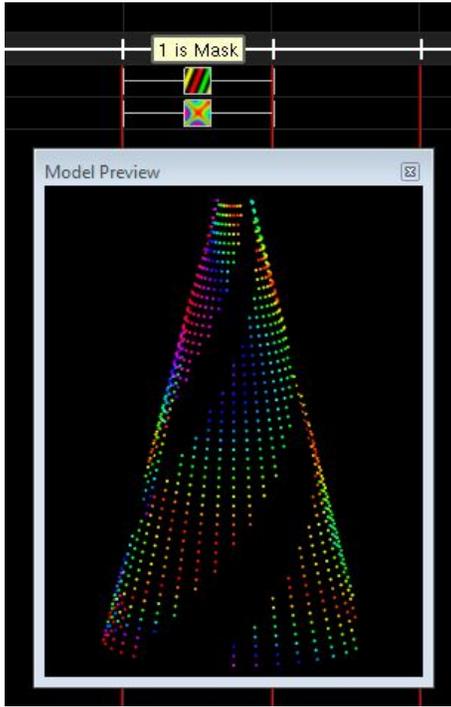
Layer Blending Modes	Layer Blending Mode Results
Normal	Both layers will show, with layer 2 showing only where there is blank space from layer 1 as in thin spirals for example.
Effect 1	Ignore effect 2 and only show effect 1. Good for being able to hide an effect if you're not sure you want to use it.
Effect 2	Ignore effect 1 and only show effect 2.
1 is Mask	Effect 2 will show wherever effect one is not showing. If E1=Fire, E2=Spirals, then the spirals would show on top of the fire, but the fire would appear to be black.
2 is Mask	Same as effect one, just reversed. Tip use Bars as the mask on layer 2 and you will have effect #1 reveal as if was coming from behind a curtain.
1 is Unmask	Make Fire E1, Butterfly E2 and set both for 1 is Unmask. You'll see the awesome power of this blending mode.
2 is Unmask	Make Bars E1, Fire E2 and set both for 2 is Unmask. You'll see the awesome power of this blending mode.
1 Reveals 2	Effect one will show on top of effect 2, except for areas in effect 1 that are black. Effect 2 will show on the black areas of Effect 1.
2 Reveals 1	See 1 reveals 2. Same result, just transposed.
Shadow 1 on 2	The the layer 2 effect will show in the shape of layer 1. Try E1=Circles, E2=Butterfly to see what this does.
Shadow 2 on 1	Effect 2 will overlay on effect #1, where there is no black in effect #2.
Layered	Try Effect #1 as circles, E2=Bars with one of the colors as black
Average	This what you would expect as layered. If E1 and E2 had yellow and blue circles, they would turn a dull green where the circles overlap.
Bottom Top	Effect 2 will appear on the top half of the model. Effect 1 will appear on the bottom half of the model.
Left Right	Effect 1 will appear on the left half of the model. Effect 2 will appear on the right half of the model.

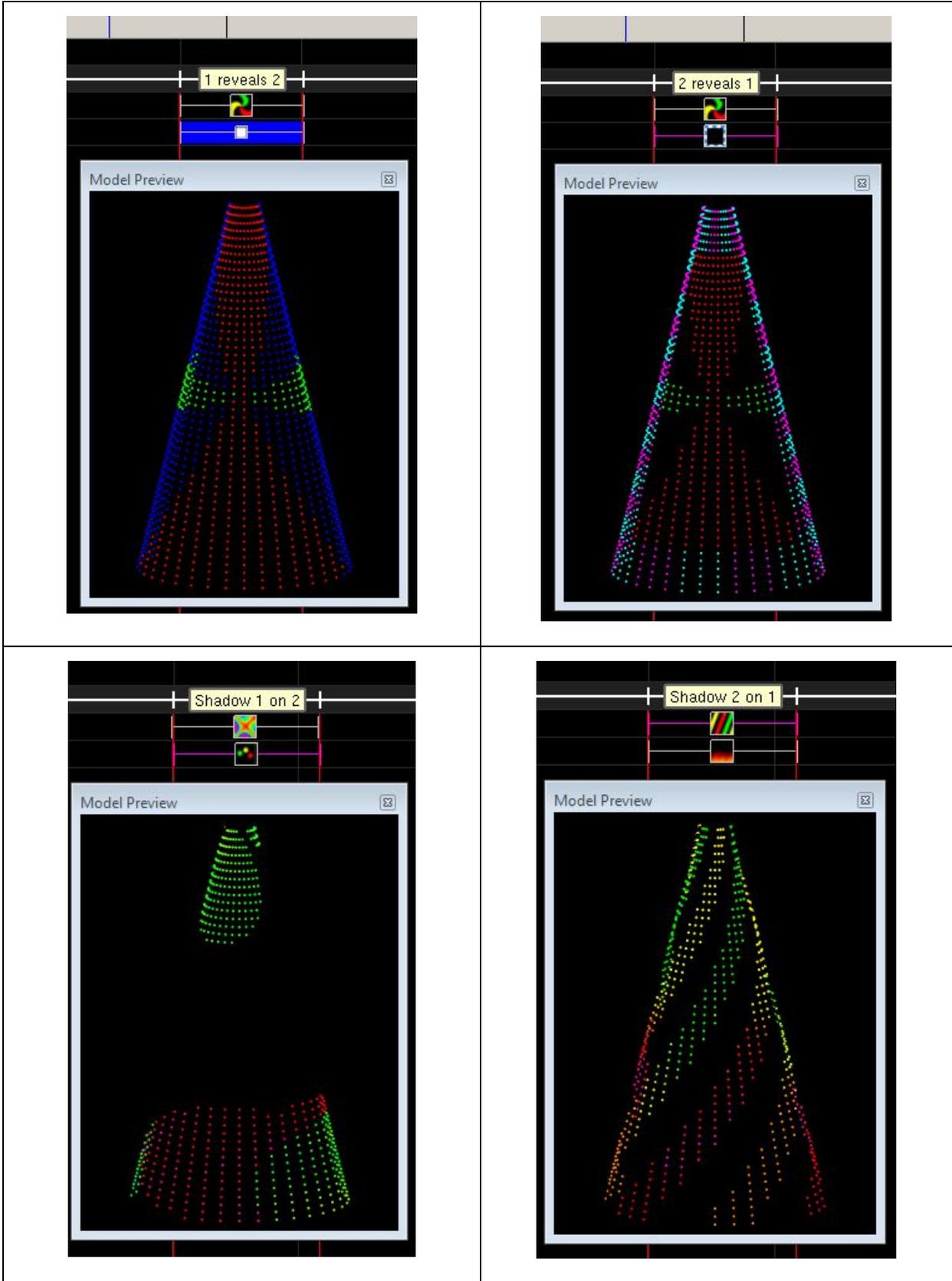


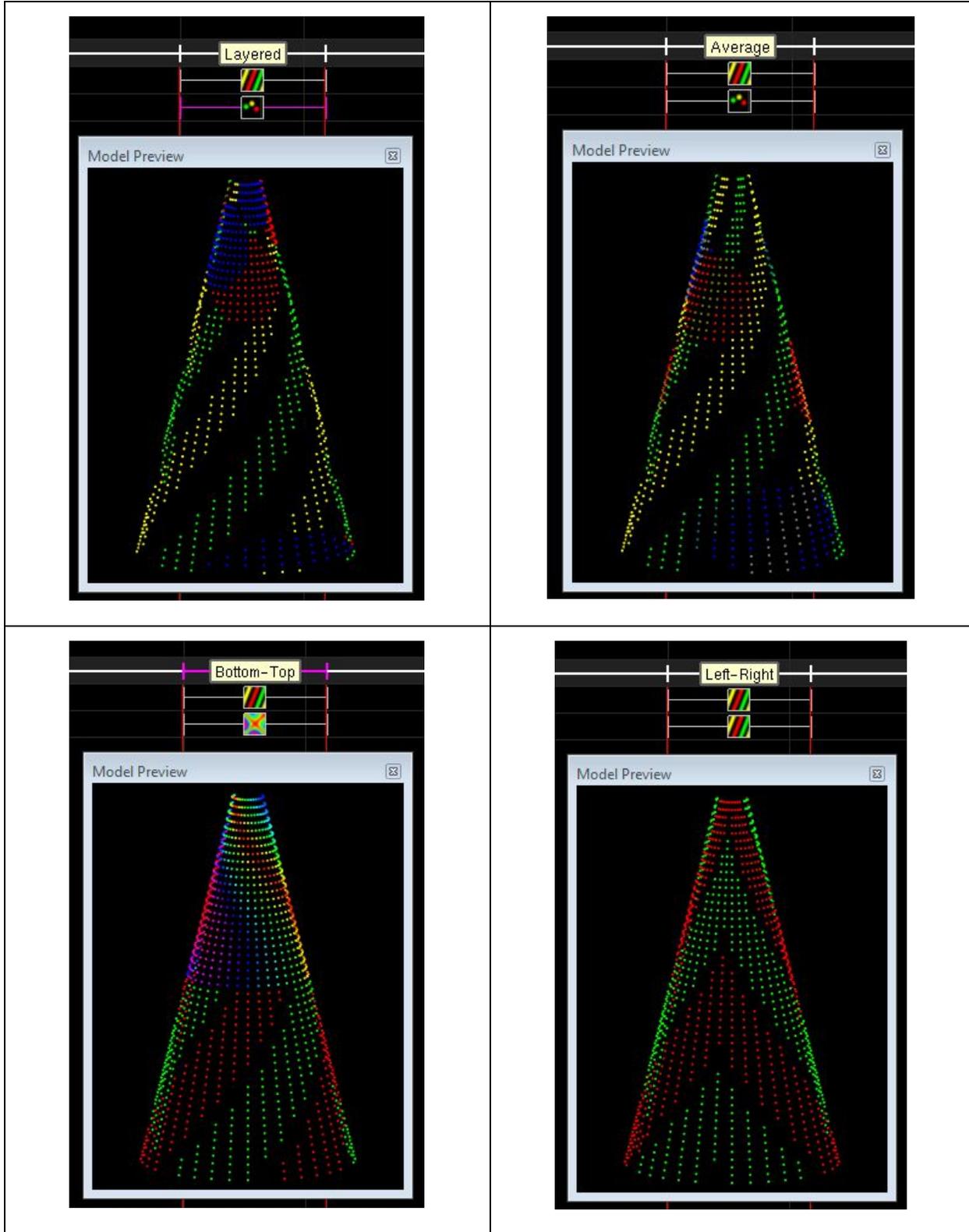
**Tip:** Put two effects on a model and step through each of the layering modes to see what they will look like. Experience is much better than reading about it.



### Layer Blending Samples





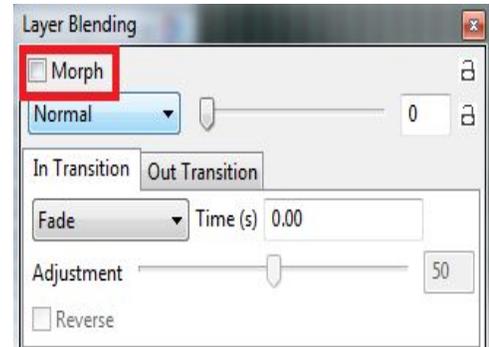




### Layer Blending - Morph

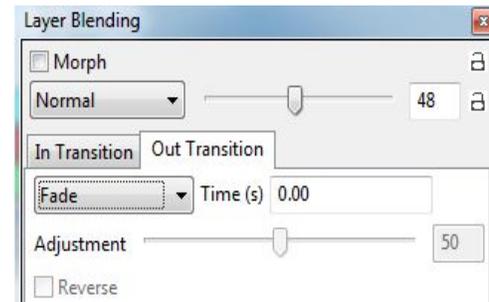
This is not to be confused with the Morph Effect. This is a layering option that can be applied to any two effects.

The morph option of layer blending will magically make effect 1 'morph' into effect 2 during the length of the timing cell that the effects are in. You will not see effect 2 at the beginning of the timing cell, and you will not see effect 1 at the end of the timing cell. Somewhere near the middle you will see the effect 1 'morph' into effect 2.



### Layer Blending - Transitions

There are 10 layer blending transition choices. Using the transitions will help you bridge between effects providing a way to smooth out abrupt changes between different effects. A stylistic use would be between sections of a song such as the chorus to verse or verse to verse. Keep in mind that the blending is done within the boundary of the timing mark and does not transition between timing marks.



These transition choices are:

- Fade
- Wipe
- Clock
- From Middle
- Square Explode
- Circle Explode
- Blinds
- Blend
- Slide Checks
- Slide bars

These transitions are common in the video editing world, and should be visually familiar to anyone who's used video editing software or anyone who's watched anything on TV in the past 20 years.



**Tip:** When setting a layer transition, the setting will apply to all future effects placed, so be sure to reset the transition times back to 0 if you do not wish the transition to apply to all future effects.

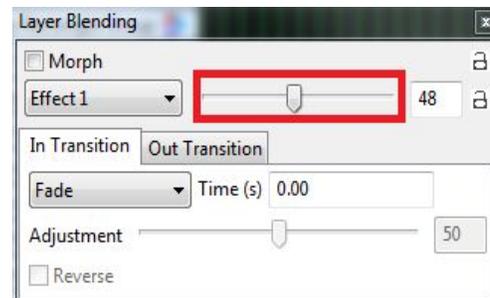
- **Fade** - This is probably the most eloquent transitions when used with two effects. For a 5 second long timing mark, fade the first effect out for 5 seconds, and leave the second effect alone. At the end of the timing mark, the first effect will be non-existent and the second layer will be shown as normal.
- **Clock** - This uses a circular motion as the hand of a clock from the center of the model to wipe the effect in or out. The adjustment slider sets the starting position and the reverse checkbox allows for a counter clockwise wipe.
- **From Middle** - This is a curtain type wipe either from the middle or towards the middle depending if the effect is placed on the in transition or the out transition. The reverse makes the effect operate in a "to the middle" mode instead of "from the middle"



- Square Explode - This transition will draw the effect starting from the middle of the model and expand outwards with square edges until the model is filled. The reverse button starts drawing the effect from the outer edges and filling in towards the middle.
- Circle Explode - Same as square explode, except the shape is circular instead of square.
- Blinds - This transition is analogous to twisting the wand to open vertical blinds. The adjustment slider determines how many blinds are used. The reverse checkbox determines the direction that the effect will fill in from.
- Blend - This transition effect when used as an “in” transition rapidly fills the model with square chunks until the model is full. Likewise when used as the “out” transition, square chunks of the effect disappear until no pixels are left. The adjustment slider determines the size of the chunks.
- Slide Checks - This transition is a checkerboard type transition where the effect starts out with a checkerboard type of mask on the model and then the black portions are filled in either left to right depending on the reverse button selection. The size of the pattern is set via the Adjustment slider.
- Slide Bars - This transition is broken up into 1-24 horizontal slices of the model determined by the Adjustment slider value. The effect selected will be filled in from opposite sides of the model interlacing each section until the model is filled. Slowly interlace your fingers with your palms facing you. That is how the effect looks on the model for the “in” transition.

#### Layer Blending - Mix Slider

This slider adjusts the level of each effect in the combined output of the effects. You can use this to just put a hint (or more) of one effect on another.



#### Layer Settings

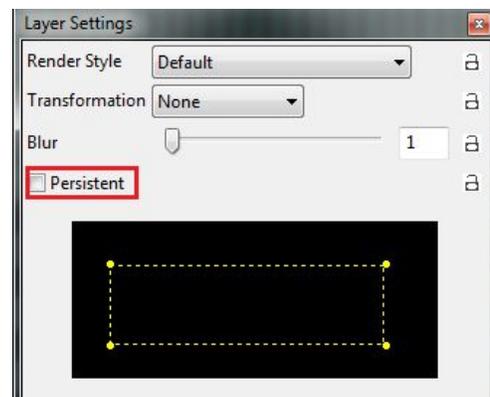
The Layer Settings window can be opened by clicking on the Layer Settings icon from the toolbar, or via the View, Windows menu.



#### Persistent

The Persistent option when enabled does not clear the display buffer before rendering each frame. The result is the preview frame remains until overwritten by a subsequent frame. For example, drop the balls or fan effect on a model, select the blending to “Effect 1”, then toggle Persistent on/off. You will see a huge difference. Doing the same for a “Chase” effect also results in a very different look.

The term came from high persistence scopes where each trace just kept layering on top of previous traces.



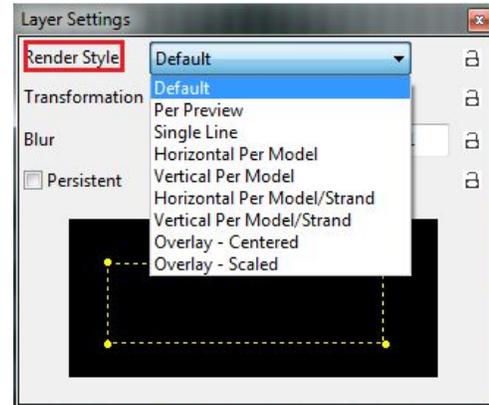


### Render Style

This attribute controls how the buffer is laid out for a model or model group when the effect is rendered. Every model has a 'Default' value which is the buffer layout that was used prior to this attribute being introduced.

For example, for Arches – the default is 'Stacked Up', for a Star model, the default is chase across the face of a star.

Additional options are available to change the buffer representation for the model or group. The list of values that are selectable are dynamic depending on the type of model.



Per Preview – this will render the way the model has been laid out in the preview.

Single line - if selected for a star model, will go along the outside, middle, then inside layers.

Layer matrix - takes each layer and lays them on top . So the outer will be bottom and inner will be top.

There is no need of creating multiple models for the same channel group. Single models can be used for different types of effects.

For model groups, additional buffer render styles are available.

Examples:

Spinners (Model group)

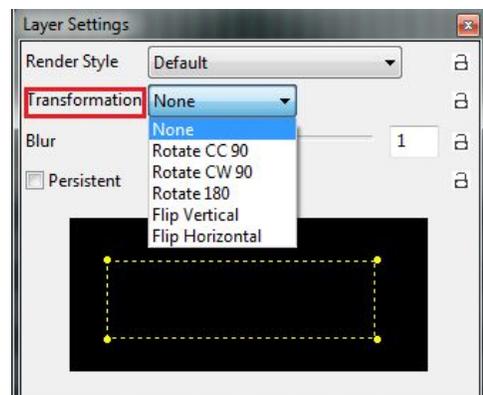
- Default : Chase goes from left to right
- Single line – each arm lights up individually
- Hor per model – each line is stacked left to right – so each arm lights up in turn.

### Transformation

The transformation attributes can be used to rotate the effect clockwise, counter clockwise (90 or 180 degrees) or to flip it either horizontally or vertically.



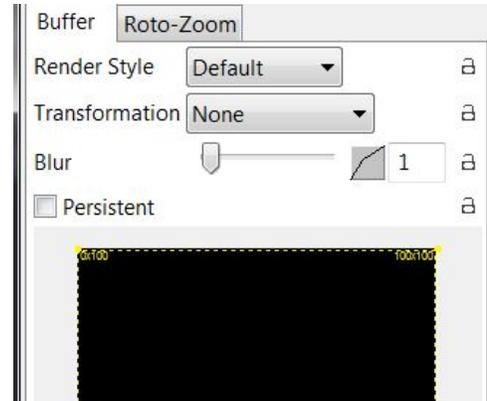
**Note:** While some effects have settings to do similar things this is now the standard way to flip or rotate an effect.





### Blur

This attribute will cause the effect to 'blur' i.e. the colors become less distinct (hazy) and the edges of two colors will fade into each other i.e. will not have sharp edges. The level of haziness can be increased from 0 onwards using the slider or adjusted using the Value Curve functionality by clicking on the Value Curve icon.

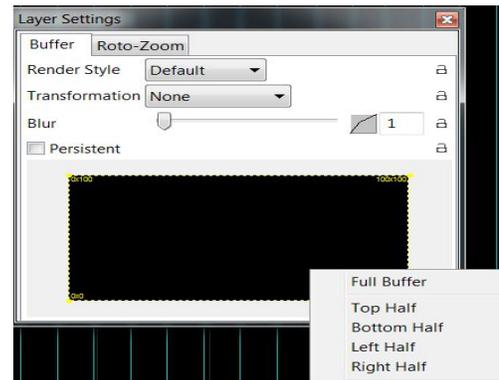


### Sub Buffer Selection

The Sub Buffer selection can be used to limit the area that an effect is active. This basically redefines the size of the model/group (on a per effect basis). This option is different than masking, because the entire effect is rendered based on this new model size, whereas a mask covers up what you specify.

So if you only want the effect to be on the top half of the model or group, bring the bottom part of the dotted yellow line to the middle of the black box. The 'handles' of the yellow grid are in the corners. Double Clicking will reset the defaults to the full size.

**Tip:** If you right click on the black box you can access and select some of the common buffer settings. 'Full Buffer' will reset to the full size.



As an example, drop the Fire effect on a Model Group covering your 'whole house'.

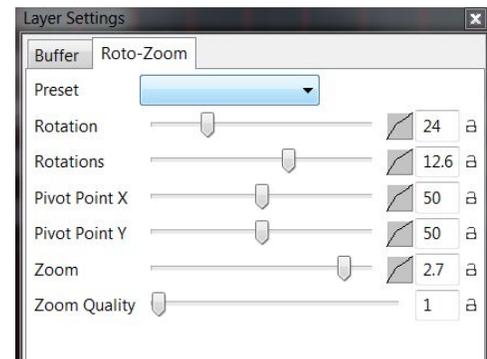
Then adjust the yellow dotted lines of the box inwards and look at the effect it has on your house preview. You can limit the effect to say the left side of your house, with another similar one of a different color on the right side of the house applied on another layer.

### Roto-Zoom

The Roto-Zoom functionality enables the effect to be Rotated as well as have aspects of the effect Zoomed.

The Preset defines the type of rotation to be applied to the effect. The effect can be continuously rotated clockwise or counterclockwise, made to explode outwards, implode inwards, shake etc.

The Rotation attribute changes the orientation of the effect. The attribute cannot be used if a Rotation Preset has been selected.



The Pivot x, y attributes work if the Rotation attribute has been used by moving the point at which the effect rotates along the x or y axis.



The Zoom attribute increases the size of the effect - for a Text effect - the text will be made larger. The Zoom quality increase or decreases the pixels when the zoom attribute is used. These two attributes cannot be used if a Zoom (i.e. explode or implode ) Preset has been selected.



**Tip:** Select the Preset of 'None - Reset' to reset the settings before trying another combination or if the rotation / zoom settings appear to be different to what is expected.

### Singing Faces

This section describes how Singing Face functionality i.e. the conversion of phrases from song lyrics or sentences spoken out aloud can be converted to work on Coro faces or Images on a matrix or Mega tree natively in xLights i.e. without using the Papagayo application.

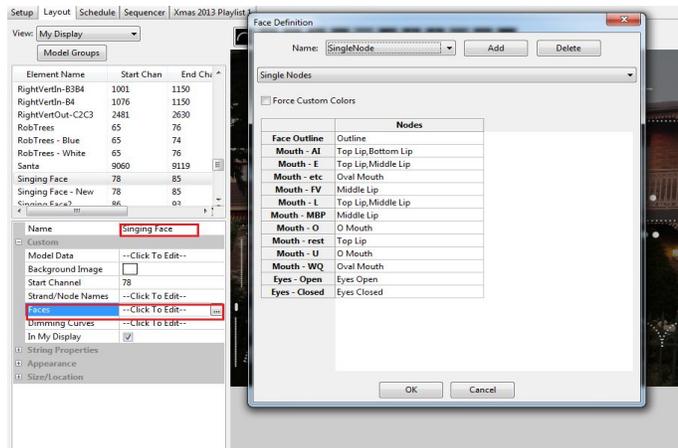
#### Model definition

##### Coro Faces

In the model setup screen, for the singing face model, click on the Faces box .

The first drop down box is used to select the type of face definition that is required.

Select 'Single Node' or 'Node Ranges' for Coro faces or 'Matrix' if you are going to use images for each face position.

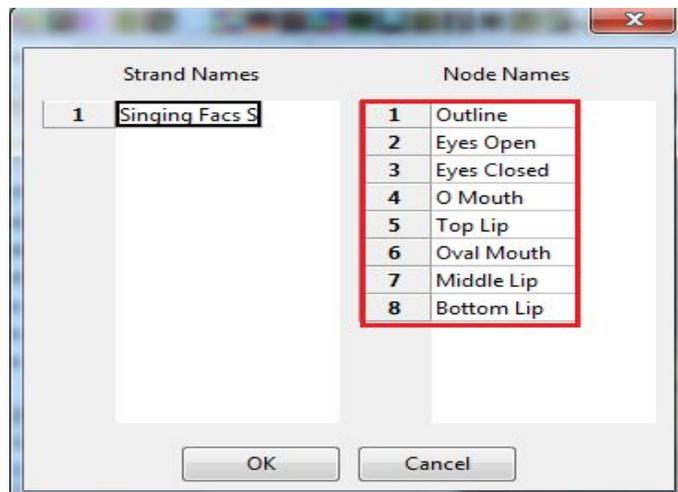


##### Single Node (Coro faces)

For each phoneme, select the channels that will be turned on. Multiple selections can be selected, by holding down the CTRL key.

Click on the Model Data box to define the layout of the face. This has been described in the Custom Model section.

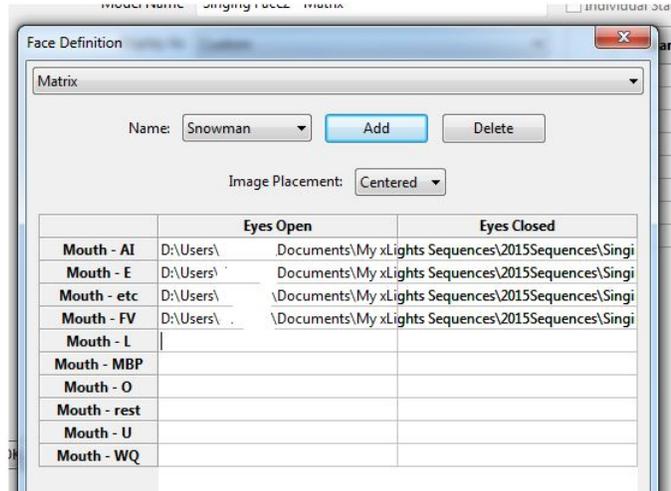
Click on the Strand/Node Names box and define the Node Names for each channel.





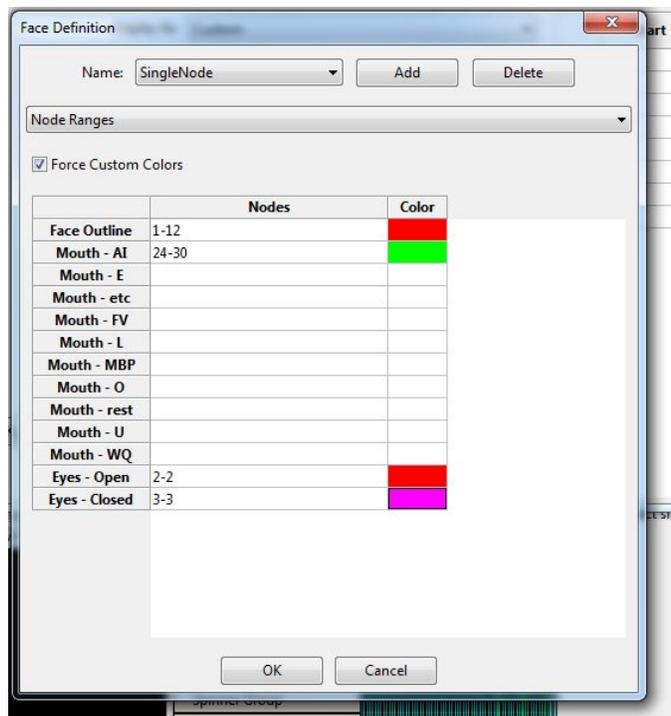
### Matrix

If a matrix is selected, then the following window will be displayed.



### Node Ranges

If 'Node Ranges' is selected, then the following window will be displayed. Type in the list of node numbers (pixel numbers) for what should be turned for each movement. Example: ("1-12,24-30"). If Force custom colors is selected, then a color to be turned on can be specified for each line in the definition by double clicking in the Color column to bring up the Color palette.



Click on Add and specify a name for the face definition ('Snowman')

Then select the image placement i.e. Centered or Scaled.

Then for each mouth position, double click in the eyes open column (you may need to double click more than once) and navigate to and select the face image corresponding to that mouth position. You can specify different images for the Eyes Closed position or by default, the same image is copied across.

Click Ok when done.



**Caution:** Images used for pictures and faces use the location reference you specify when you added the image. xLights attempts to resolve the location of the image if it cannot be located where specified. If the images are in your show directory or in a sub folder inside your show directory, then the image will be found. In other cases, the new location may not be detected.

### Timing Tracks

Next add a new Timing track. Timing tracks can be added via the Setting, Sequence Settings, Timing menus.

Select a Timing Track of type 'Empty' and click on OK to add it. Double click on the name of the timing track and change it to something meaningful, such as 'Lyrics'.



If you have more than one Voice, then repeat this process for the second Voice i.e.

Add a new Timing track. Select one of type 'Empty' and click on OK to add it. Double click on the name of the timing track and change it to something meaningful, such as 'Lyrics 2'.

On the sequencer tab, right click and select Edit Display Elements or click on the icon and add the new timing track(s) ('Lyrics' / 'Lyrics2' or any other name of your choice) to the view that you are working with.



If the Singing face model is not part of the view, then add that to the view too.

### Importing Phrases

Phrases/Lyrics for Voice 1

Select the Timing Track ('Lyrics') and for clarity deselect any others. There are two ways to add the phrases/lyrics to the Timing Track.

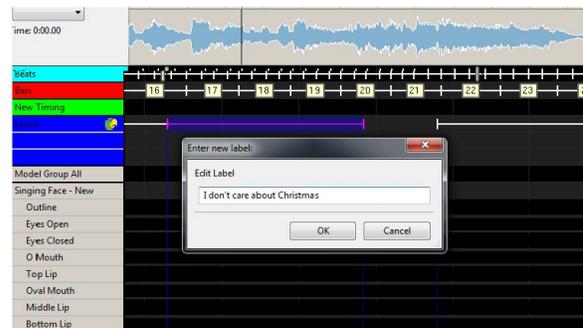
1. Importing the entire set of Lyrics. Obtain the lyrics from the internet or elsewhere, copy them, then Right click and select 'Import Lyrics'.
2. Type or paste the lyrics into the Window and press OK. The words of the lyrics will be evenly distributed across the song.



**Note:** It is also possible to import an entire timing track (that another person has exported) containing the Lyrics, Words and phonemes via the Import Timing Tracks option. The file must be an .xtimings file.

### Using timing marks

Play through the song at regular or reduced speed and use the 't' key to add timing marks at the beginning of each phrase. Then on the timing track, between two timing marks, double click and an 'Edit label' box will pop up. Type in, or copy and paste the words that pertain to the phrase (or phrases) that belong between the two timing marks. Press Ok to accept.



Repeat for as many phrases as you require or you can do one phrase at a time.

### Breakdown Phrases

You can break down all the phrases into words by right clicking on the timing track to the left of the Papagayo icon and selecting the Breakdown Phrases option. This will breakdown all the phrases into words or you can do this in sections i.e.

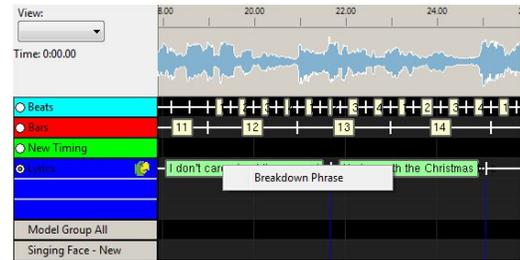
Highlight a phrase or group of phrases, right click and accept the Breakdown Phrase option.



**Note:** Due to the loading of dictionaries, there could be a delay of several seconds the first time this is used in each session, while the first phrase is broken down.

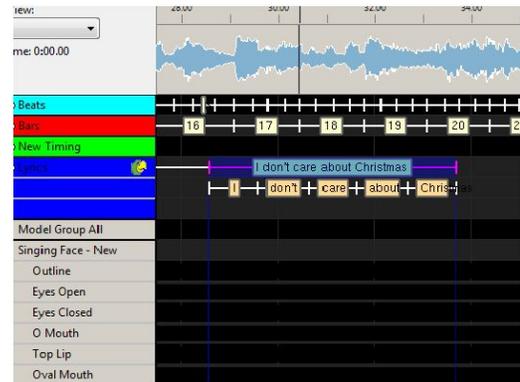


A list of words will be generated for the phrase in a timing track, just below the phrase.



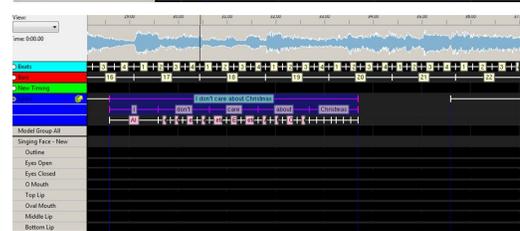
### Breakdown Words

You can break down all the words into phonemes by right clicking on the Timing Track to the left of the Papagayo icon and selecting the Breakdown Words option. This will breakdown all the words into phonemes or you can do this in sections ie: highlight a group of words, right click and accept the Breakdown Word or Breakdown Selected Words option. If the Breakdown Selected Words option does not appear, ensure that your cursor is not pointing on a word, otherwise you may only see the Breakdown Word option.



A list of phonemes will be generated for the word or words phrase in a timing track, just below the word timing track.

Zoom in to see the words or phonemes more clearly. Drag the words to align them as required.



You also need to separately drag the phonemes to align them as required.

If you wish to regenerate a word or words, highlight the words, right click and select Breakdown Word or Breakdown Selected Words option.

Select and drag the Face effect to the sequence grid against the model (your Singing face model).

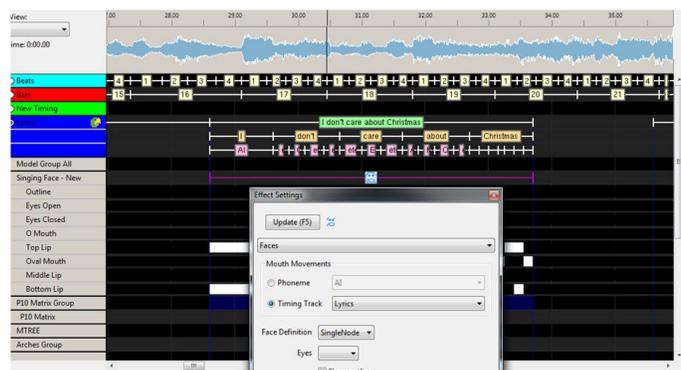


**Tip:** Ensure that the color selected on the color window is correct based on your model definition (White is the most common setting).



**Tip:** If the Timing track name ('Lyrics1') does not appear in the list of Timing Tracks, click on another effect and then return to the Face effect to force the list to be refreshed.

Using the Effects Setting window, under Mouth Movements, select the applicable Timing Track ('Lyrics'). The face definition value will default to the one defined for the model.



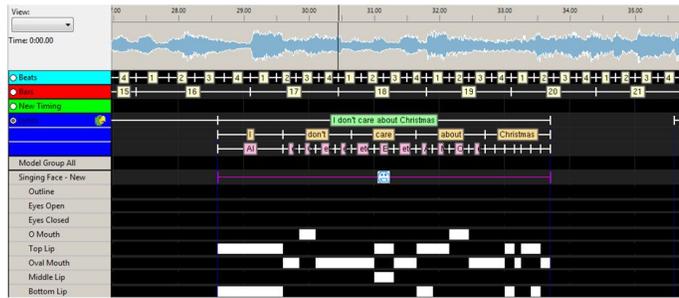
You can also select 'Show Outline' which will activate the outline when the face effect is present and 'Turn On/Off Eyes', if you wish. Setting the eyes to Auto will cause the eyes to



blink every few seconds when the rest phenome is on.

The timings should automatically appear against each mouth movement.

Repeat the process for the next phrase or group of phrases.



### Phrases / Lyrics for Voice 2

Similarly, repeat for the next Voice by selecting another model ('Singing Face 2'), and the next Timing Track ('Lyrics 2'). When you drop the Face effect on the sequence grid, select the second timing track ('Lyrics 2') as the Timing Track on the Effects option and proceed as described for Voice.



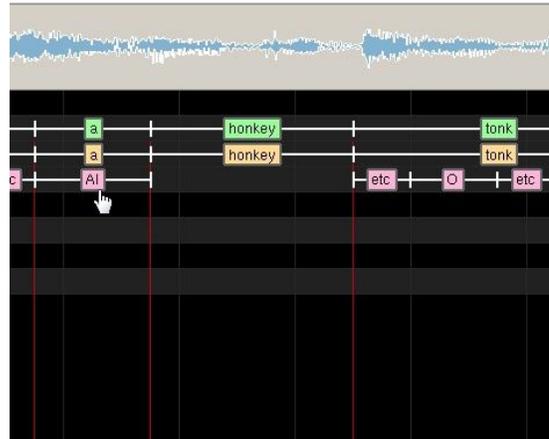
**Tip:** If you wish to assign a group of phrases/words/ phonemes from one Voice/timing Track to another, then against the model of the second voice ('Singing face 2'), for the selected group of phrases ('Chorus'), when you drop the Face effect, select the first timing track ('Lyrics') and the effects from that timing track will be duplicated.

### Checking for Unknown words in the dictionary

This step will help eliminate any words that xLights may not have in its library.

As you breakdown words in xLights, occasionally you may see that there is no phonetic breakdown of the word placed in the timing track. As shown below.

As you can see there is no pink phonemes below the work 'honkey'. This means that the word is not in any of the xLights dictionaries which are standard\_dictionary, extended\_dictionary and user\_dictionary.



These dictionaries contain information that assist xLights in converting each word into phonemes. Each word in the dictionary is listed with its associated phonemes. As xLights proceeds with the breakdown process there may occasionally be a word that it cannot find in these dictionary files. When this happens there is a simple process to add that word to the user\_dictionary.

When xLights is first installed this file is located in this folder: C:\Program Files (x86)\xLights

This folder is the default folder that xLights is installed into. This can change if you decide to install xLights somewhere else.

To keep this file from being overwritten in future installs you should move the user\_dictionary file to the folder where you store your sequences.



This user\_dictionary is a simple text file which can be edited by using a text editor such as windows notepad or any other text editor such as Notepad++ to open this file. The only file that you should make any additions to because the other two files will be overwritten each time xLights is installed. When you first open the user\_dictionary file it will contain the information shown below.

```

user_dictionary /notepad
File Edit Format View Help
## You can add your own words to this user dictionary.
## For example, some proper nouns will not appear in the standard dictionary.
## Also strange, "cartoony" words will likely not appear.
##
## Each entry must be on its own line in the file. First is the word as normally written.
## Next, the word is followed by the phonemes used to pronounce it.
## These must be CMU-style phonemes, not Preston Blair phonemes. The CMU phonemes are more
## complex, but also more complete; using CMU phonemes will also allow Papaya to map them
## to other phoneme sets in the future.
##
## To start with, there is just one sample entry in this dictionary. WORLD.
WORLD W ER L D
  
```

Before continuing create a text file containing all the words that did not have an associated xLights phoneme breakdown created for. I usually name this file is 'missing words.txt' and put it in the same folder as my sequences. There is no special formatting just a list of words, one per line, is required. One thing to note here is that if you have any hyphenated words such as 'screa-um' you should break the word into two words such as 'screa' and 'um' for this list.

Then in your favorite browser open to the following webpage...

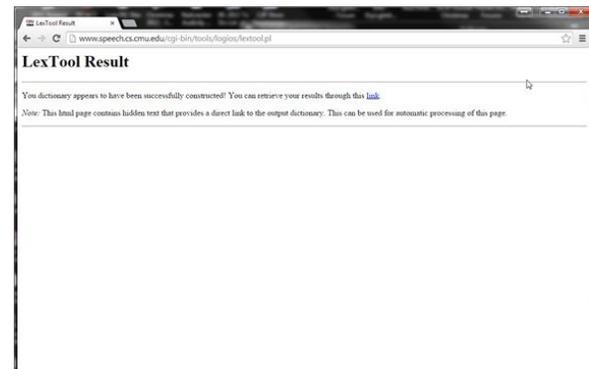
<http://www.speech.cs.cmu.edu/tools/lextool.html> as shown here:

Then click the 'Choose File' button and browse to find the file you created or enter this name into the file box. Then click the 'Compile' button.



Once the processing has completed another web page will appear similar to this:

Click the work 'link'





Another web page similar to this will appear.



Here click the file with the .dict extension such as 0548.dict, then a web page will appear with the words and their phoneme breakdown as shown below.



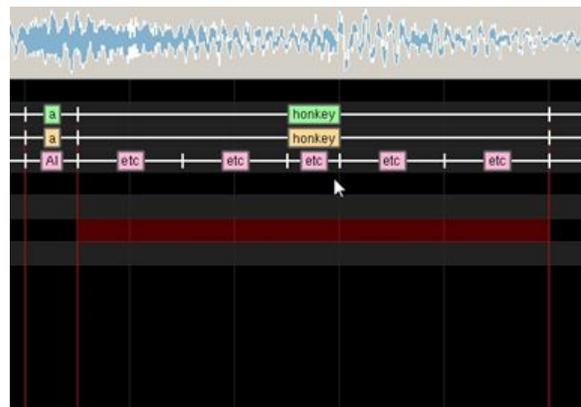
Before following the rest of this process, close the current sequence and exit xLights.

If your user\_dictionary is not open, open it now. Highlight and copy this list and paste it into your open user\_dictionary and save the newly modified file. There is a small bug in xLights at the time this document was written which you need to compensate for. After pasting in the newly added words do a search and replace with a ' ' (space) for any 'tab' characters in the user\_dictionary.

This process will work for one to how ever many words that you have. But if you just want to quickly check one word past the following link into your browser.

<http://www.speech.cs.cmu.edu/cgi-bin/cmudict>

This is the online CMU Pronouncing Dictionary. Here you will look up each word that Papagayo did not find in its dictionaries. Let's take the first word 'ooky'. There is a box below the title 'Look up the pronunciation for a word or a sentence in CMUdict (v. 0.7a)' where you will enter this word. Then click the 'Pronounce it!' button. If a red dot appears with the phrase 'not in dictionary; consider using the LOGIOS tool discussed above, which is able to generate missing pronunciations by rule.' Then you need to click the 'LOGIOS' link which takes you to the previously discussed web page.



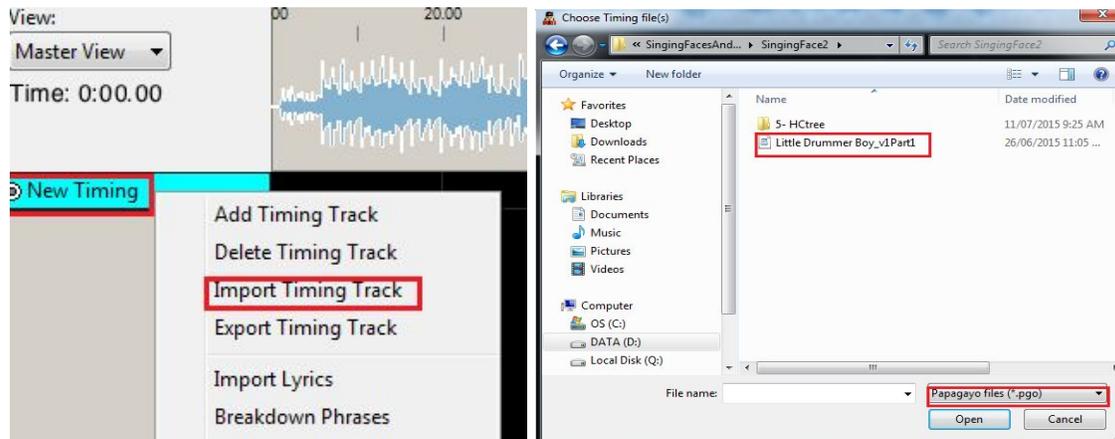
Now that you have updated the user dictionary you should reopen xLights and load the previously saved sequence and find the newly added dictionary words and do a right click 'Breakdown Word' for the missing phonemes. The image now shows the results after adding the word 'honkey' to the user\_dictionary file.



### Importing Papagayo files

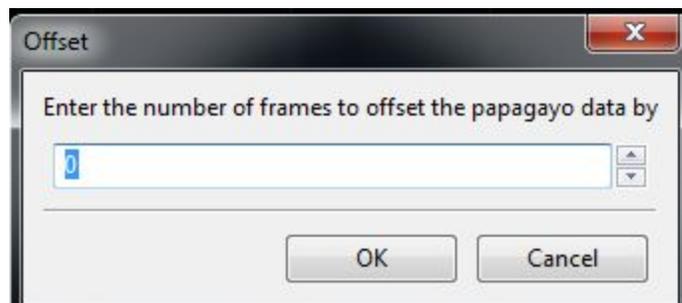
This section describes how you can import a Papagayo (.PGO) file into xLights as a timing track, so as to integrate it with xLights functionality and accordingly be able to edit and adjust it.

On the sequencer tab, after creating a new musical sequence or opening an existing musical sequence, right click on the Timing name and select Import Timing Track. Browse to the location of the Papagayo pgo file and select the file.

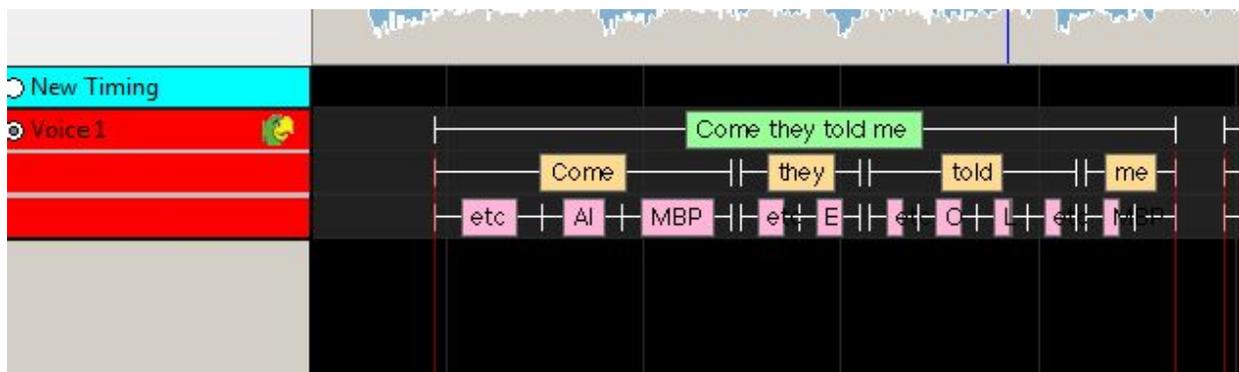


Specify the number of frames to offset the data by. Due to a performance limitation in the Papagayo software, a sequence often had to be broken up into segments. In which case the second segment had to be offset by the number of frames of the first segment.

For the first segment being imported the offset is zero. Click on OK



The Phrases, words and phonemes are imported and a timing track with the three components is created for each Voice contained in the PGO file. The phrases, words and phonemes can then be edited, moved and adjusted similar to one that had been created within xLights.



The following image shows a snippet of what the file contains. The 4th line contains the total number of frames and the 5th line has the number of Voices in the file, followed by the details for each voice.



```
lipsync version 1
Little Drummer Boy-Ray Conniff.wav
20
4104
1
Voice 1
Come they told me |pa rum palm palm palm|A new born King to see |pa rum palm palm palm|Our finest c
35
Come they told me
219
294
4
Come 219 249 3
219 etc
230 AI
238 MBP
they 250 262 2
250 etc
256 E
told 263 284 4
263 etc
268 O
274 L
279 etc
me 285 294 2
285 MBP
290 E
pa rum palm palm palm
```



*Intentionally left blank.*



## Chapter Five: Menus

### File

#### New Sequence

- Musical Sequence*
- Animation Sequence*
- Metronome Timing Track

#### Open Sequence

#### Save Sequence

#### Save As Sequence

#### Close Sequence

#### Select Show Folder

#### Back Up

#### Alternate Backup

#### Recovery

#### Quit

### Edit

### Tools

#### Test

#### Convert

#### Generate Custom Model

- Static Channel Example
- Pixel Node Example

#### View Log

#### Package Log Files

#### Export Models

### Playlist

#### Add

#### Rename

#### Delete

#### Refresh

#### Custom Script

### View

#### Zoom In

#### Zoom Out

#### Perspectives

#### Windows

- Sequence Elements*
- Model Preview*
- House Preview*
- Effect Settings*
- Color*
- Layer Blending*
- Layer Settings*
- Effect Dropper*
- Effect Assist*
- Perspectives*

### Audio

#### Speeds

### Import

#### Import Effects

#### Importing a LOR Sequence

#### Importing an xLights Sequence

### Settings

#### Sequence Settings

##### *Info/Media*

##### *Metadata*

##### *Timings*

##### New

##### Import

##### Data Layers

##### [Import](#)

##### [Delete](#)

##### [Move Up/Move Down](#)

##### [Re-Import](#)

#### Render on Save

#### Backup on Save

#### Backup on Launch

#### Alt Backup Location

#### Tool Icon Size

#### Grid Spacing

#### Grid Icon Background

#### Grid Node Values

#### Render Mode

#### Auto Save

#### Effect Assist Window

#### Open GL

#### Reset Toolbars

### Help



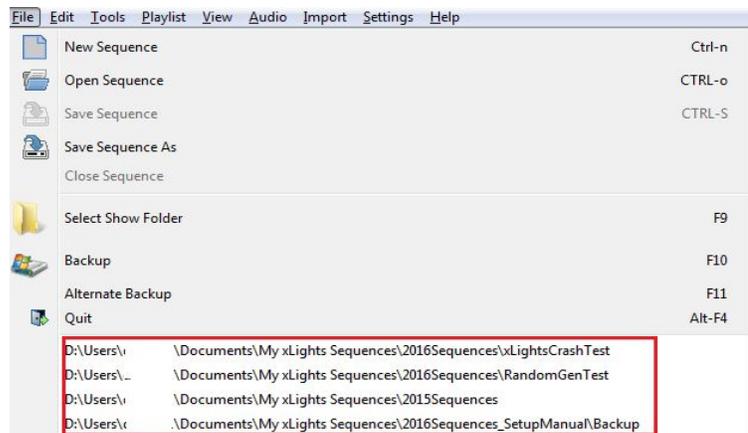
## File

The File menu enables you to create a new xLights sequence, open an existing xLights sequence, Save, Save As or Close a sequence that is currently open, select a show directory, backup xLights sequences to another directory and quit the xLights application. These actions can also be done using shortcut keys and via icons on the top bar of the canvas.



If you click on the File menu, at the bottom, last 4 show directories that have been used will be displayed.

If you select any of the items listed, your show directory will be changed to the selected directory.



### New Sequence

To create a new sequence, either use the New Sequence icon, select New Sequence from the File menu or press Ctrl N. The following screen is displayed:



**Note:** if you do change your mind about creating a sequence, click on the Don't Create Sequence button.



#### *Musical Sequence*

If creating a music sequence, click on Musical Sequence. A 'Choose Audio File' window will open, defaulting to your media directory.

You can select 'FPP Audio files' or 'xLights Audio files' to filter which file types can then be selected.

FPP Audio files:

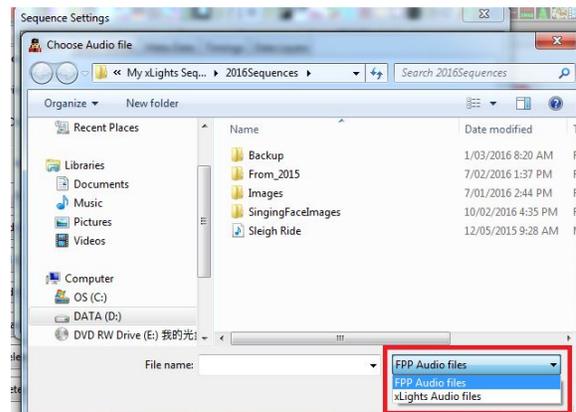
\*.mp3;\*.ogg;\*.m4p;\*.mp4

xLights Audio files:

\*.mp3;\*.ogg;\*.m4p;\*.mp4;\*.avi;

\*.wma;\*.au;\*.wav;\*.m4a;\*.mid;\*.mkv;\*.mov;\*.mpg;\*.asf;

\*.flv;\*.mpeg.





If in doubt, select FPP Audio files.

**Warning:** The most common supported files on the FFP are .mp3 and .ogg. There is limited support for .mp4 and .m4p files for audio. Constant Bit Rate (CBR) audio works well. Variable Bit Rate (VBR) is quite uncommon.

Select the frames per second (fps) for your sequence.

The most common one used is 20fps (50ms).

On the Timing tab you can select one or more of a number of timing bar options, which will generate timing marks automatically (similar to those that can be done via Audacity).

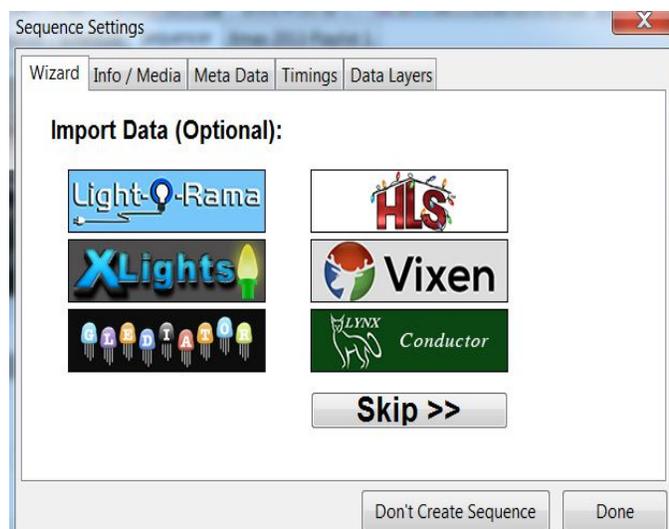
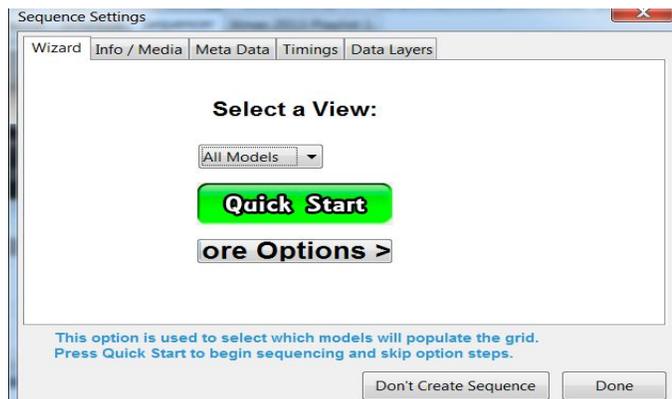
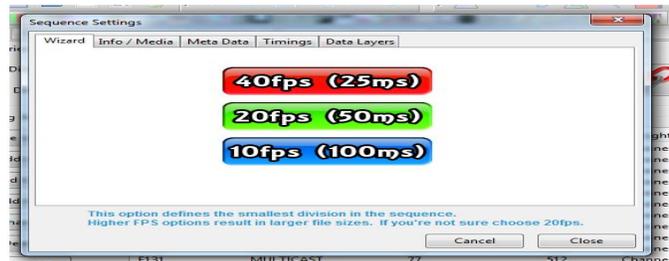
If intending to create an xLights sequence, on the next screen, select the View that you wish to use on the sequencer screen (use the Drop down if the View displayed is not what you require) and then press Quick Start.

The next screen displayed will be the sequencer grid and all the models from the selected View, will be displayed.

If you selected More options from the previous screen, then you are presented with this screen.

If creating an xLights sequence, at this stage you can select 'Done' and import timing marks later (either via the Timings menu or by Right Clicking on the Sequencer menu). Alternatively, you can click on the Timings tab now – this will lead to the Timings menu.

Press either Skip or click on Done.



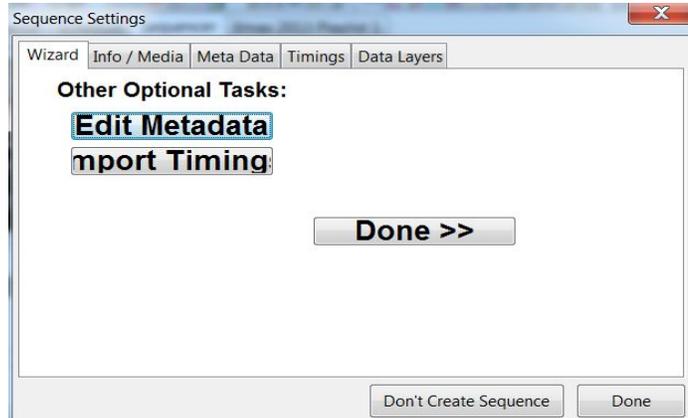


If you pressed Skip then the following screen is displayed:

If you click on the Edit Metadata tab, this will lead to the Sequence Settings dialog box.

You can Import a Timing Track or click on any of the tabs for the corresponding functionality.

Click on Done when complete.



At this stage a new empty sequence has been created. You can...

- Select Save to save the sequence in your show directory – you will be prompted for a sequence name.
- Click on the Sequencer tab and continue with
  - Adding models for this sequence to the sequencer view,
  - Creating/adding timing marks
  - Dropping effects on the sequencer grid
  - Playing the sequence



**Tip:** Ensure that you save the sequence prior to exiting to save the work that has been done so far. By default though, the layout and sequencer changes are saved every 3 mins to a backup file i.e. 'xxx.xbkp' file in your show directory (where xxx is the name of the sequence).

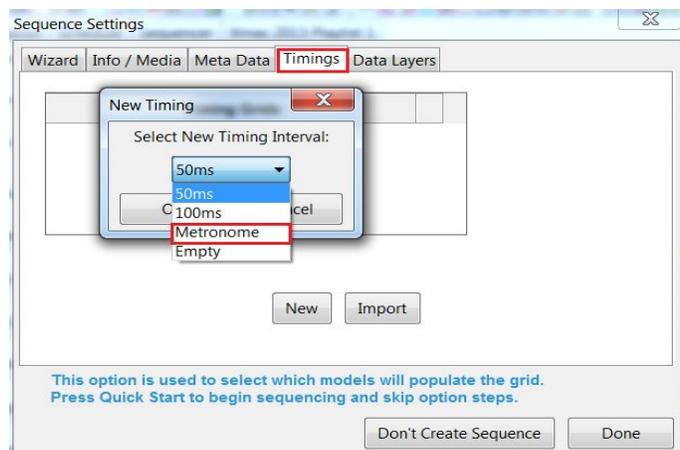
### *Animation Sequence*

If creating an animation sequence, click on Animation Sequence. No media/audio file is required or requested for.

### Metronome Timing Track

This option enables you to create a timing track with marks at fixed intervals of your choice e.g every 1 second or every 5 secs. This is especially useful for animation sequences so that you don't then have to go through and create timing marks manually.

Click on Timing and then from the drop down window, select the Metronome option.



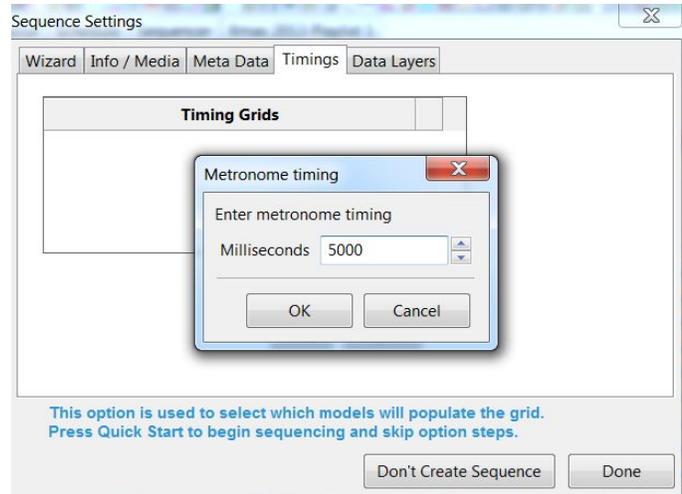


In the popup window select the timing interval between each mark in milli secs ie 1000 for every 1 sec , 5000 for 5 every secs etc.

It must be a multiple of the base timing selected (ie 50 milliseconds if 20fps was selected on the previous screen).

Click on Done when complete.

xLights will create a Timing track with timing marks at the specified intervals.



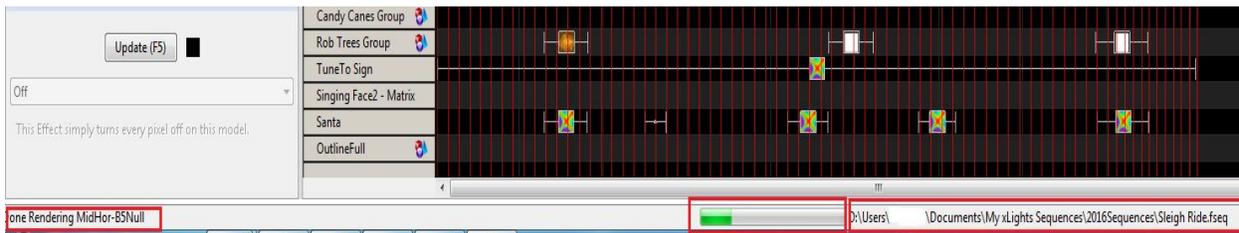
The subsequent process is the same as in the Musical Sequence. By default, xLights will create an animated sequence that is 30 seconds in length. To change this , click on Settings , Sequence settings and you can change the Sequence duration.

### Open Sequence

To open an existing sequence, either use the Open Sequence icon, select Open Sequence from the File menu or press Ctrl O. You will be presented with the 'Choose Sequence file to open' window, with the directory defaulting to your show directory. Select the required xLights (xml) sequence file to open. You can also select the fseq file and it will open the xml file referenced within.

### Save Sequence

To save an open sequence, either use the Save Sequence icon, select Save Sequence from the File menu or press Ctrl S. If the sequence has not been saved previously, you will be presented with the Save As dialogue window to enter the name for the sequence. If the Render on Save setting (under the Settings menu) is set (i.e. ticked) then all the effects on all the models will be rendered first before the sequence is saved in the fseq file. This is the default. Progress status messages are displayed on the last line of the window with a progress bar indicating the render progress.



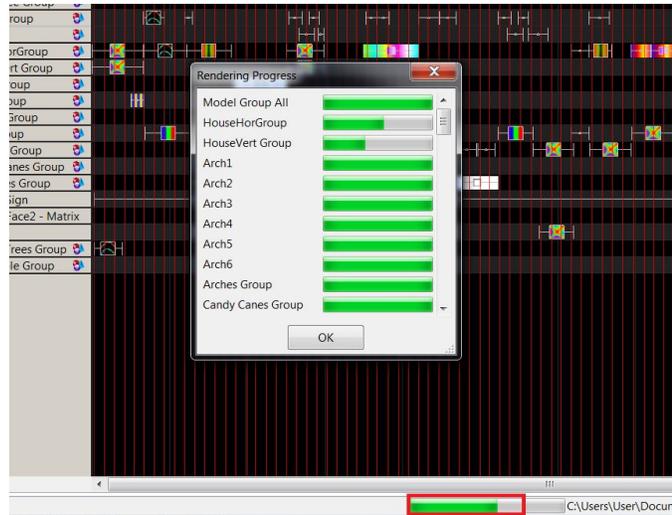


When the sequence has completed saving, a message will be displayed on the last line indicating the name of the fseq file and how long the save process took.

If you click on the green progress bar, a window opens and you can see the render progress of each model / model group.

One line is displayed for each model or Model group that is being rendered.

You can stretch and expand the window to see all the models.



### Save As Sequence

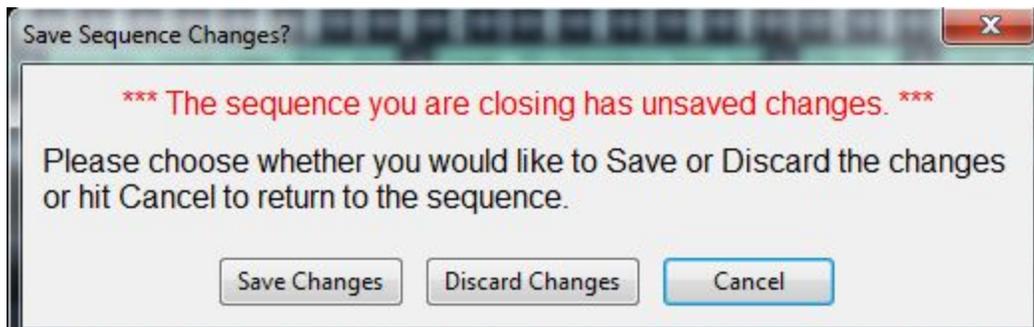
To save an open sequence with a different name, either use the Save As Sequence icon or select Save As Sequence from the File menu. You will be presented with the Save As dialogue window to enter the name for the sequence. If the Render on Save setting (under the Settings menu) is set (i.e. ticked) then all the effects on all the models will be rendered first before the sequence is saved in the fseq file. This is the default. Progress status messages are displayed on the last line of the window. When the sequence has completed saving, a message will be displayed on the last line indicating the name of the fseq file and how long the save process took.



### Close Sequence

To close the currently open sequence, select Close Sequence from the File menu.

If the sequence data has not been saved since the last change, you will be presented with warning.



Click on Save Changes if you want to save your changes. If you click Cancel then you will be returned to the sequence. If you select and click Discard Changes, then the sequence will be closed without any sequence changes being saved.



## Select Show Folder

In order to change your show Directory, select Select Show Folder from the File menu, press F9 or click on the Change button against the Show Directory on the Setup tab. You will be prompted to navigate to and select a new directory folder to select.

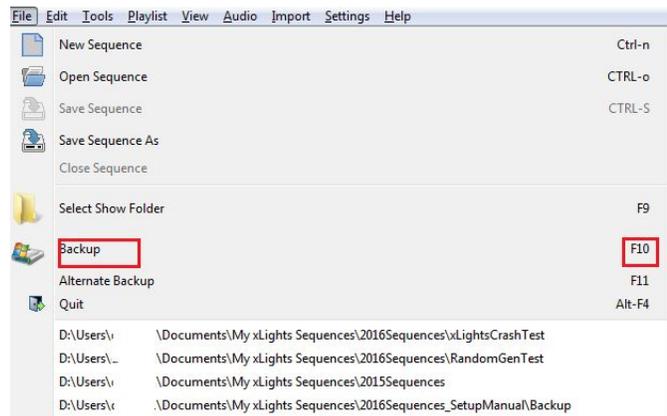
Ensure that you have the correct xLights xml files (xlights\_keybindings.xml, xlights\_networks.xml and xlights\_rgbeffects.xml) in your new directory.

## BackUp

Backing up your critical files and sequences should be done regularly – as good practice.

What should be backed up ? Anything you require to run your show, but in particular your xml sequences, your media files and your user specific xLights configuration files.

The xLights configuration files are located in your show directory and are: xlights\_keybindings.xml, xlights\_networks.xml and xlights\_rgbeffects.xml



 **Tip:** By default xlights backs up the key files at the start of a session when xLights is launched.

The files are saved in a subfolder with a timestamp and ‘\_onstart’ suffix.

It will also create a backup when the show directory is changed.

If you have enabled Backup on Save, it will also take a snapshot after every Save operation.

 **Tip:** Pressing F10 anytime, anywhere will backup your XML files for you and store them in a new folder with the date/time embedded in the name the backup was created. You can press F10 as many times as you like and should do this at least once per sequencing session. Keep in mind that you must have saved at least once in order for an updated XML file to be protected.

Name	Date modified	Type
2016-07-05-060347_OnStart	5/07/2016 6:03 AM	File folder
2016-07-05-061008_OnStart	5/07/2016 6:10 AM	File folder
2016-07-05-185442_OnStart	5/07/2016 6:54 PM	File folder

Alternatively, from the File menu, select Backup.

You will be presented with a message indicating where a backup will be created. Click Yes to proceed.

Every time this step is executed, a copy will be created of all the ‘\*xml’ files from your show directory into the Backup subdirectory of your show directory. A new subfolder is created each time a backup is executed.

## Alternate Backup

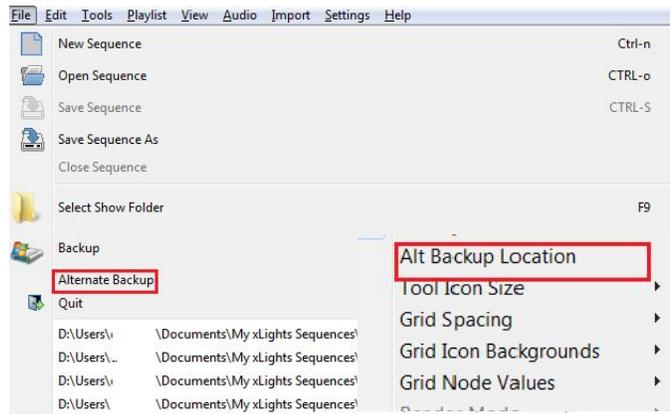
The Alternate Backup function enables you to specify and use a different location to back your files up, other than the default location that the F10 backup functionality provides for.



Click on F11 or select this function from the File menu. The first time you use this function, you will be prompted for the location that you wish to back the files to. Navigate to the required location and select the folder. The prompts after that are similar to the Backup functions.

Subsequently, clicking on F11 will save the files to the specified location.

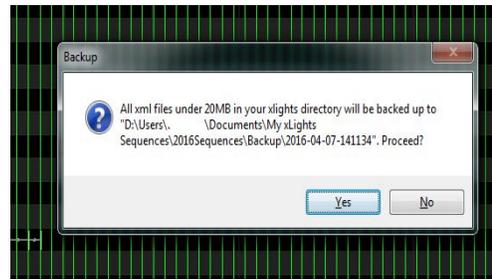
You can change this location via the Settings, Alt Backup Location menu.



**Note:** The F11 function does not do an auto (in memory) backup of the current sequence if you have one open. It will backup the open sequence xml contents from when it was last saved.



**Tip:** It is a good practice to also separately backup any files that you may have used as inputs to your sequences such as LSP, LOR, Papagayo files that you imported, media files that may have amended with audacity, gif or jpegs etc. You may also wish to backup any fseq files, though this can be recreated by saving the sequence again.



Backing up the show directory (and media directory if it is different) to an alternate location is the simplest way to ensure that you have the files required.

## Recovery

To summarise the backup functionality:

- When xLights starts up - a folder timestamp\_OnStart is created and the xml and xbkp files in the show directory are backed up there.
- When F10 / F11 is pressed, a folder (timestamp) is created in the show/alt location and the above files are backed up there (referred to as an on demand save).
- Every x (3,10,15,30) minutes, the current open xml (i.e xxx.xml) is backed up (overwrite) to xxx.xbkp or \_\_.xbkp (for a new unnamed sequence) in the show directory. This will occur if there have been any changes since the last auto save or on demand (F10/F11) save.
- Every x minutes (same value as set above), the xlights\_rgbeffects.xml is backed up to xlights\_rgbeffects.xbkp in the show directory. This includes the layout as well. This will occur if there have been any changes since the last auto save or on demand (F10/F11) save.

If you need to recover:

1. If you want to restore the xml you were working on, then (Shut down xLights first and then)
  - Rename existing xxx.xml to say xxx\_old.xml, and rename xxx.xbkp to xxx.xml. For a new unsaved sequence, just rename \_\_.xbkp to xxx.xml. Render All and Save.
  - If this does not work as required, then look for the latest backup timestamp created using F10, F11 or in the 'timestamp\_OnStart folder' and replace the xml as above.



- If that does not work, then go to the next oldest backup by timestamp etc



**Note:** If you have changed show directories then also look in the show directory you were working in for backups created there. When you change show directories the onStartup backup will also be created for the new show directory ... ensuring you always have a start of session backup.

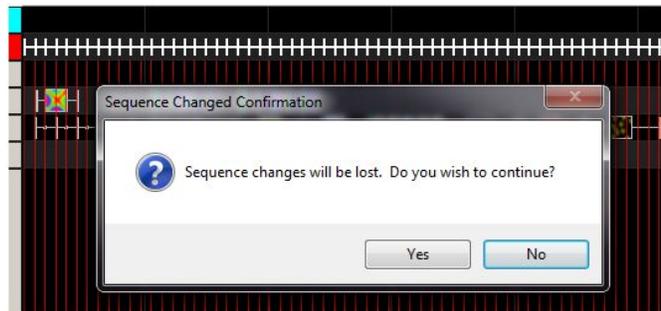
2. If you need to restore the xlights files, then
  - Rename existing xlights\_rgbeffects .xml to say xlights\_rgbeffects\_old.xml, and rename xlights\_rgbeffects.xbkp to xml to xlights\_rgbeffects.xml from your show directory.
  - If this does not work as required , then look for the latest backup timestamp created using F10 , F11 or in the 'timestamp\_OnStart folder' and replace the xlights\_rgbeffects. xml as above.
  - If that does not work, then go to the next oldest backup by timestamp etc
3. If you have recently changed your network definition and you need to recover that , then look for the xlights\_network.xml file in the most recent timestamped folder and copy and replace the current one (after renaming the current one).

## Quit

To quit xLights, select Quit from the File menu or press ALT F4.

If you have a sequence open and the sequence data has not been saved since the last change, you will be presented with warning.

If you click No, then you will be returned to the sequence. If you select and click Yes, then the sequence will be closed without any sequence changes being saved.

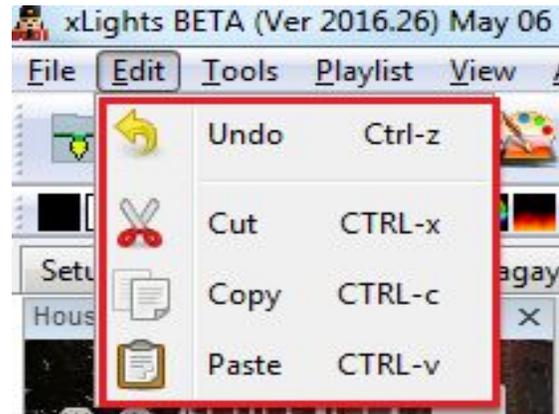




## Edit

From the Edit menu , you can select the Undo, Cut, Copy and Paste functions and apply them where where applicable. As an example, when on the sequencer grid, you can highlight an effect, click Edit and then click on Copy (to copy the data to the clipboard). Move your cursor to where you want the effect to be duplicated and then click File and Paste.

You can also use the associated Ctrl keys instead ie Ctrl C and Ctrl V in this case. The functionality of each option is self explanatory.



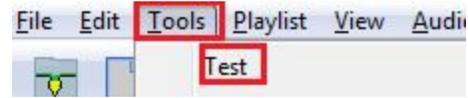


## Tools

The Tools menu contains the Test , Convert, Generate Custom Models, View Logs, Package Problem Files and Export Models functions.

### Test

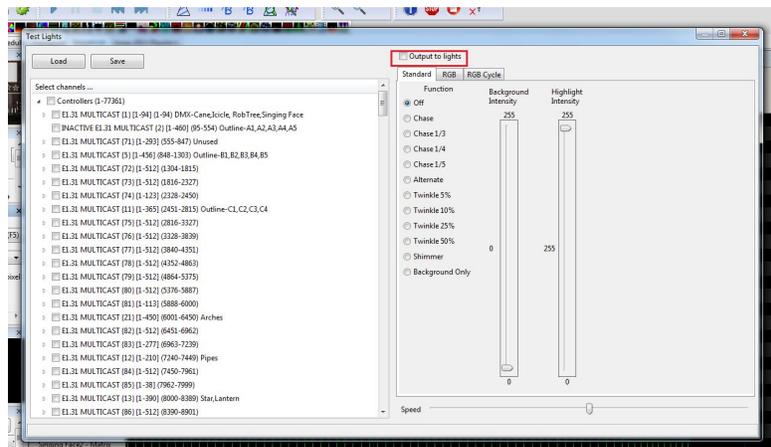
The test tab enables you to test anything from a single channel, all channels for a model or all channels by sending different test patterns to your physical lights.



Ensure that output is enabled by selecting the Output To Lights button. The Lights button will turn yellow when active. At the end of testing, click on the Lights Off button. The yellow bulb will turn off.

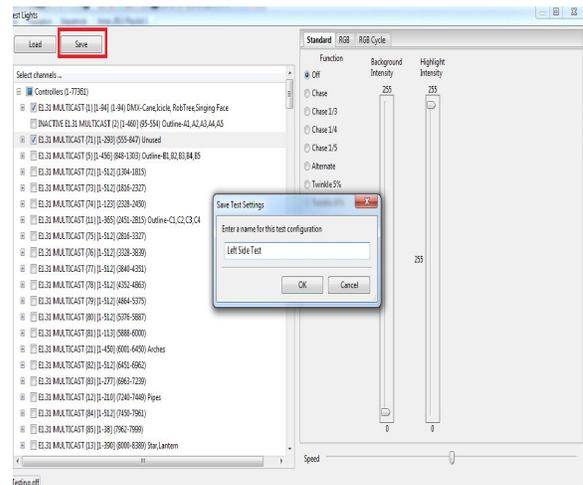


You can also select the Output to Lights attribute on the Testing screen.



When you first access the Test tab, you will be presented with a view of all the channels configured against 'Controllers', with each line (Universe/Channel range) defined in the Setup Definition shown separately. You can click against the Controller to select or deselect all channels beneath.

Once you have selected a set of channels, you can save this individual set up as a test configuration for future repeat testing by clicking on the Save button and specifying a name for that group of channels. You can load a previously saved test configuration by clicking on the Load button.

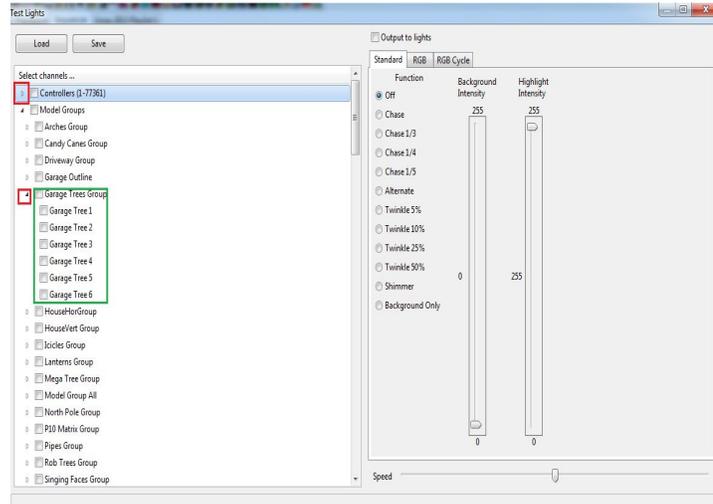




If you click on the first attribute against the top level controller item, the view toggles to one showing all the Model Groups. You can then select one or more Model groups.

You can also click against a Model Group which will then display all the models under the group. This is quite useful to test a model or group of models at a time.

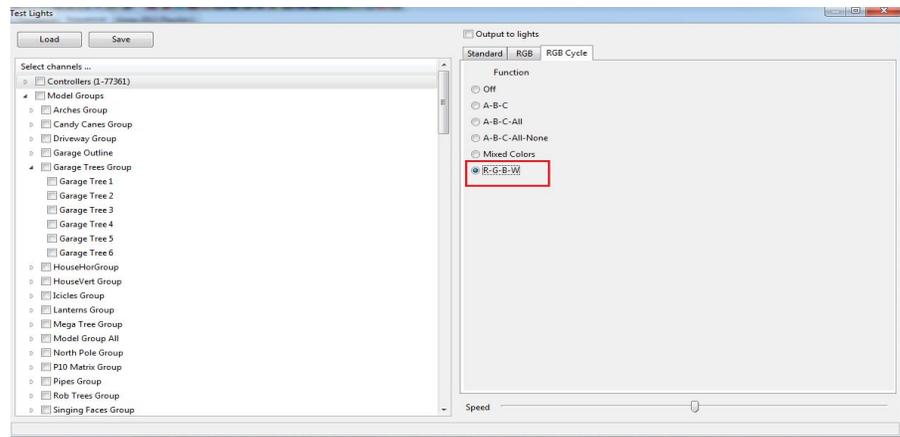
Different test functions are available for RGB, non RGB lights as well as the option to execute different test cycles. You can also select and change background as well as highlight colors and control the speed of the function using the controls provided.



**Note:** Output from the test tab is, in most cases, always in RGB sequence. It actually turns on every 3rd channel, i.e. 1,4,7,10 etc for red and 2,5,6,11, etc for green, etc and then all channels for white. A quick way to test your lights to ensure the correct RGB, BRG, GRB etc. is set properly, is to turn on channel 1. That should turn on RED. Next would be to turn on channel 2, that should be Green and finally Channel 3 should turn on Blue. Go to the first light of the string. Select the first 3 channels in the setup eg 97,98, 99. Check that Model is defined as RGB. Use background colour and move the first (Red) bar only up. Green turned on for first light. Move first bar down and move the second (Green) bar only up. Blue turned on for first light. Move second bar down and move the third (Blue) bar only up. Red turned on for first light. So the controller should be set to GBR.

If you wish that the 'RGB definition' of your model be used instead, then select the R-G-B-W option instead.

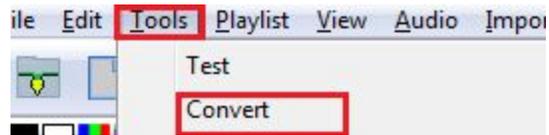
This will use the model definition and turn on the color that corresponds to the channel as defined in the model. So if the model definition is GBR, then the colors turned on will be Green, Blue and Red respectively.





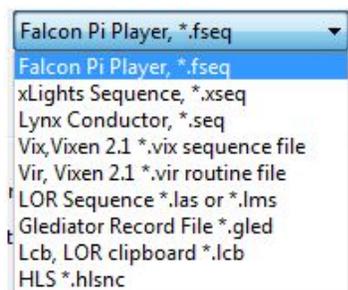
## Convert

The Convert function is commonly used to convert a sequence file from one sequencer format to the format of another sequencer or to the format (.fseq) required to run via Falcon Player on a Raspberry Pi or BeagleBone Black controller.

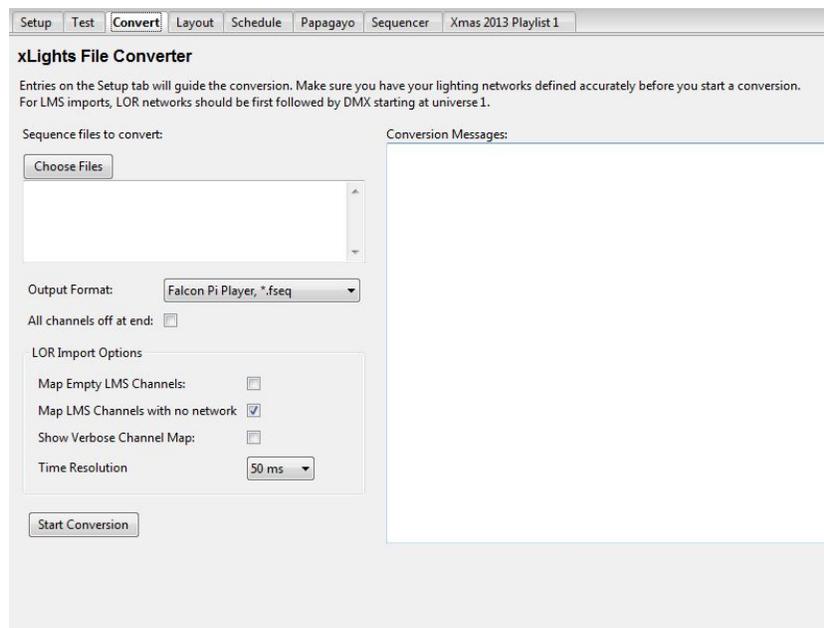
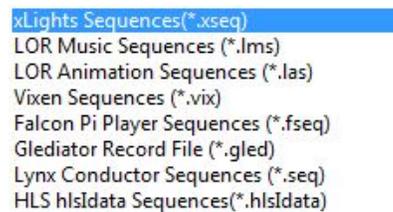


It is not to be used to convert into an xLights sequence – use the Data Layer or Import, Import Effects options to achieve that.

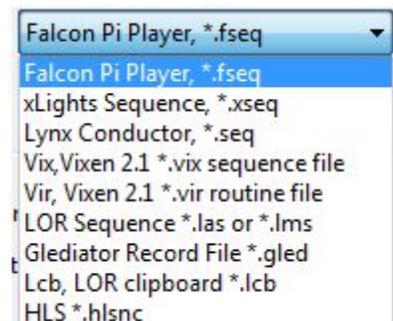
Supported input formats are:



Selected output formats are:

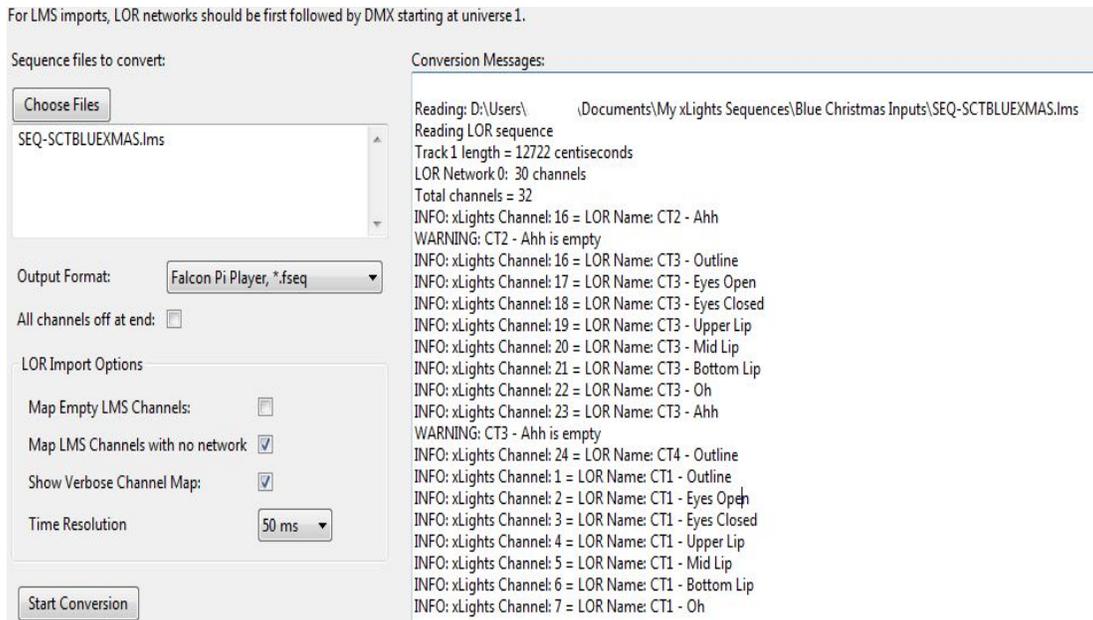


1. Click on Choose Files, and on the subsequent window, change the file type to the type of file that you wish to convert and navigate to where your input file (i.e. LSP MSQ file, LOR LMS file etc) is located. Double click to select the file.
2. Select the output Format to convert to. Supported output formats are:
3. Specify whether all channels should be turned off at the end of the sequence. (Tick if unsure)





4. Select the Show Verbose Channel Map. This option will display messages pertaining to the input sequencer channel mapping for some inputs and is useful to identify missing or misaligned channel information.
5. Select the options specific to LOR conversion.
6. Specify the time resolution i.e. (25ms, 50ms, 100ms). These correspond to (40 fps, 20 fps, and 10 fps respectively). Select 50ms if not sure.
7. Click on Start Conversion.
8. Conversion messages are displayed. If successfully converted, a file of the same name but with a different extension (i.e. as specified for the Output Format) will be created in your show directory.



With the 'Show Verbose Channel Map' selected, the conversion messages display which channels have been converted to equivalent xLights channels. This information can then be used to amend the channel mapping and/or define additional LOR controllers as required.

### Generate Custom Model

The Generate Custom Model function enables you to generate an xLights custom model using a picture or video of the physical item. You should have defined your controller and need to know which channel the model will start on and how many channels.

Select the Generate Custom Model option from the Tools menu.



There are three type of models for which custom models can be generated:

1. A static model - such as a wireframe silhouette (reindeer or similar) where a row of lights can be turned off or on. You can use the video process described here or even use a photograph of the image.
2. Pixel based effects where each node is three channels.
3. Single Channel such as Singing faces where several LED nodes turn on and off for a single channel.



**Note:** The video or photograph should be done with the model in front of a plain dark background with the lights on. There should not be too much of bright light (otherwise the bulbs as they light up cannot be clearly distinguished), neither should it be completely dark, else this will cause a scattered flash effect.

Click on the Prepare tab to generate the lights that you need to record a video for.

If the model is a pixel based model, select Type-Nodes. If the model is a single channel, select Type-Single Channels.

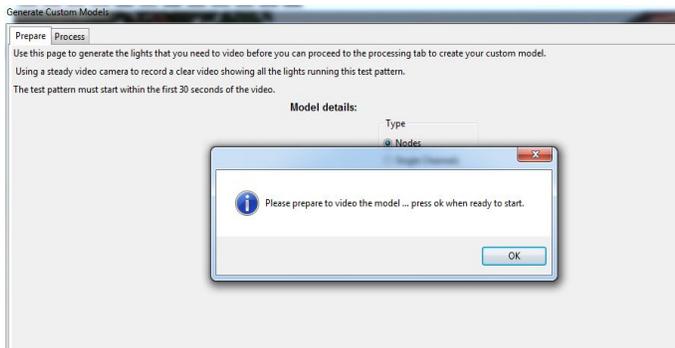
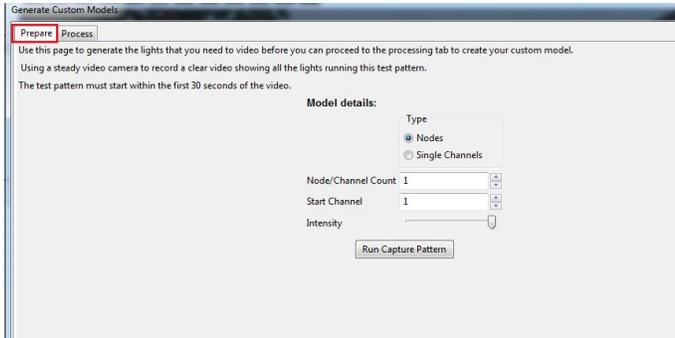
The Node/Channels counts refers to the number of Pixel nodes (Type =Nodes) or Channels (Type = channels). A face with 7 channels would have 7 specified as the Channel count. A star with 100 nodes - would have 100 specified as the count.

Static Channel example

Set Type = Nodes. The start channel corresponds to the start channel of the model definition.

Leave the intensity bar setting in the position that it has defaulted to.

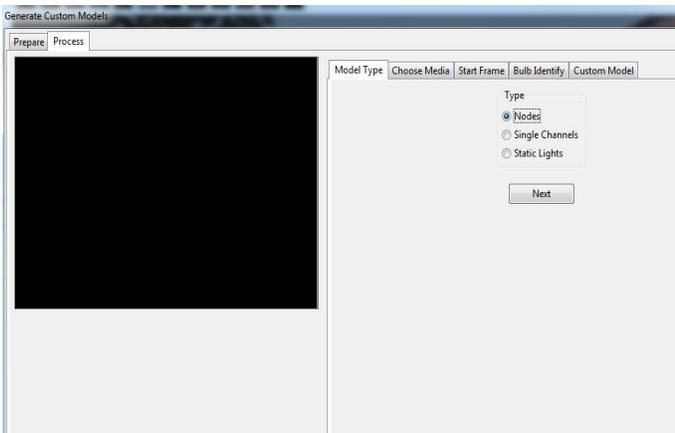
Click on the Run Capture Program. The following prompt will be displayed.



When your camera is ready, steady and in position, click on OK. The software will flash the lights twice, then run through the model definition, lighting each bulb in turn. When complete the following message will be displayed to stop the video recording. The recording has now been completed.

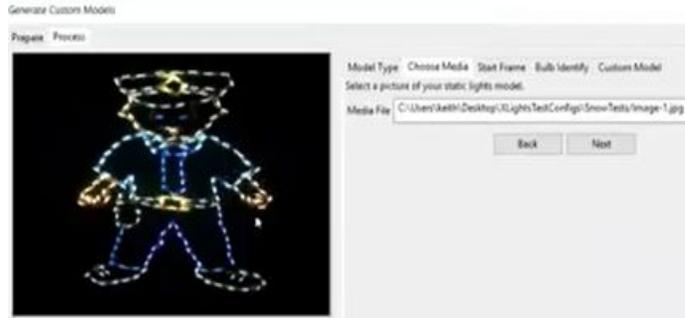
Upload/Copy the video from the camera onto your PC directory.

Click on the Process tab. Select the Type of lights and press Next.

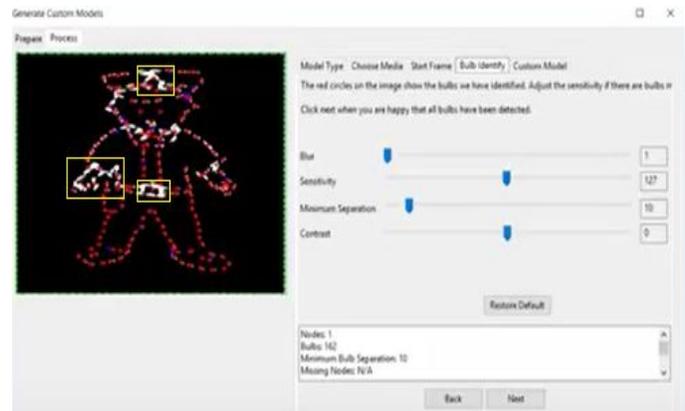




When prompted for the location of the video file, browse to and select the video file that was recorded in the earlier Prepare step. Then click on Next.



The red dots are the lights that have been found and retained. The blue dots are the lights that have been found, but have been discarded because they are too close to a red dot. If the dots are too close, then the model generated becomes too big.



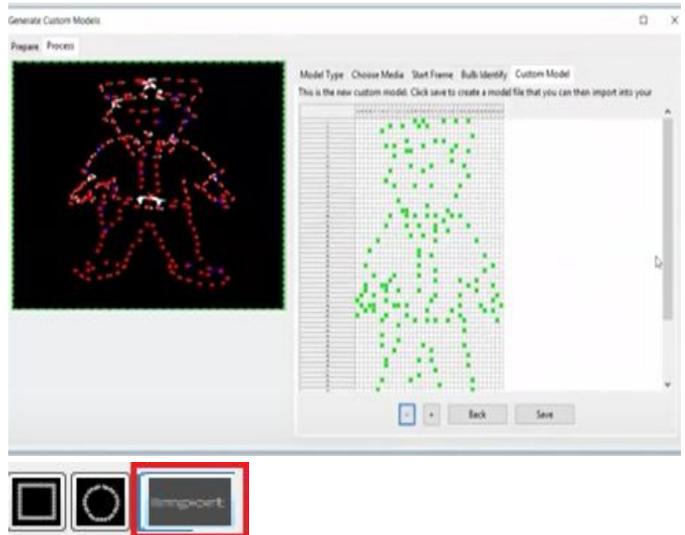
There are three areas in the image where the lights have not been detected (the yellow boxes have been added for illustration in the manual only). Increase the sensitivity (move slider to the right). The window at the bottom of the screen indicates how many nodes have been detected, the number of bulbs detected, how many nodes are missing, which nodes have more than one bulb and the size of the model.

Click Next and the model that is generated is displayed.

 **Note:** Use the '-' and '+' keys to zoom out and zoom in to see the model.

Click on Save to name and save the custom model.

Then use the Import Custom model function on the Layout screen to import the model that has just been created.



Pixel Node example

Select Type = Nodes and repeat the same process as described under the Static Lights example (Prepare). Similarly, when your camera is ready, steady and in position, click on OK. The software will flash the lights twice, then run through the model definition, lighting each bulb in turn. When complete a message will be displayed to stop the video recording.



Then using the Process screen, browse to and select the video that has been generated and uploaded to your PC.

Click on Next.

The software will examine the first fifteen seconds on the video to identify the start point (ie when the first of two flashes occurred and will then check that it can determine the pathway of the lights). A 'Looks ok' message will be displayed along with the start position on the video (2.95 secs in the example) if this is detected. If it does not work (a 'Looks wrong' message will be displayed) , or the start position does not look right , you can use the four frame buttons to move the video back or forward.

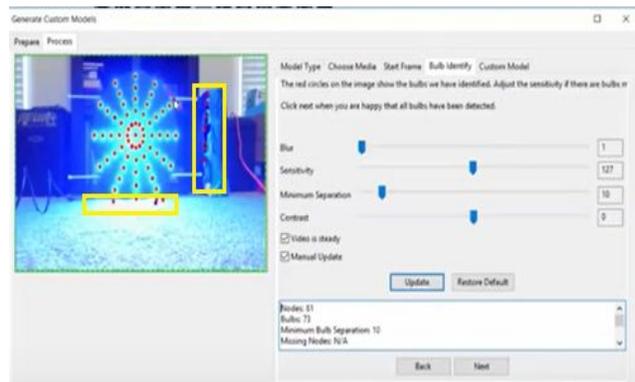
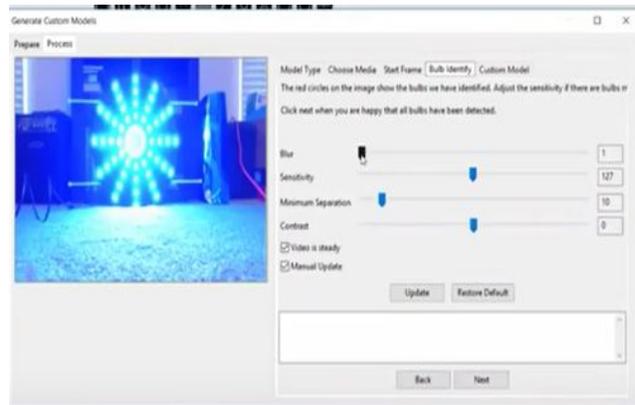
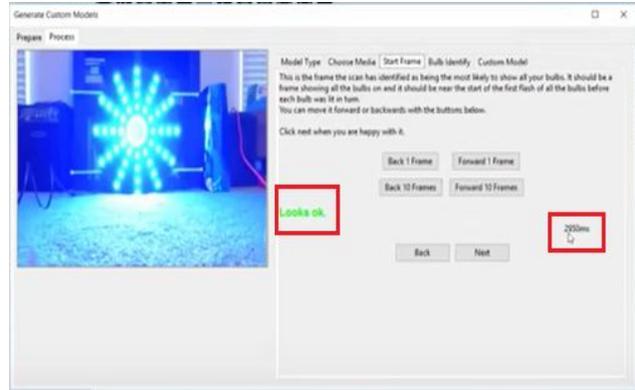
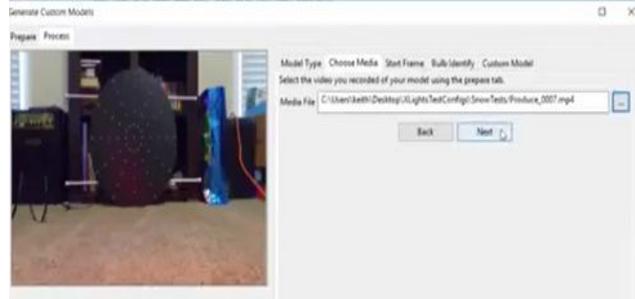
Click on Next to proceed to the next step. You can adjust the controls if required. The blur can be used (increased) to remove any dead spots, the sensitivity adjusted (right if some bulbs are not detected and left if too many are detected).

If the 'Video is steady' is selected, then the software will attempt to filter out some of the background to get a better image. Otherwise it will retain much of the background and try and compensate of an unsteady video camera , but this may generate additional pixels.

If Manual update is selected, then moving the sliders won't do anything unless the Update button in then pressed. The Restore Default button is used to restore the sliders and options to the default option.

The image shows the pixels generated (red dots). The two yellow boxes (that have been added in the manual only) illustrates spurious pixels.

The window displays the number of nodes, how many bulbs were detected, missing nodes and a list of nodes where more than one bulb has been detected. You want the number of bulbs to match the number of nodes or be as close to it as possible.

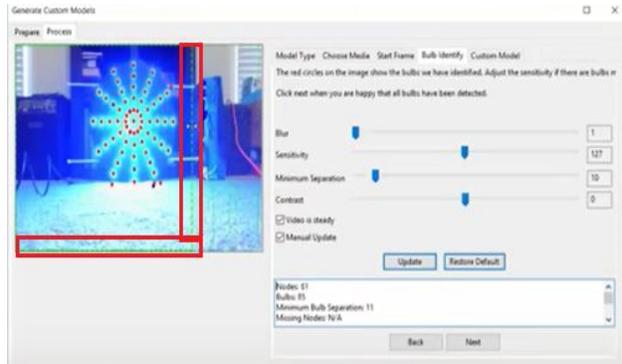




Use the Trim bars (i.e. drag them towards the image) to eliminate the pixels around the image. The number of bulbs should decrease as this occurs. Increasing the sensitivity can also be used to try and filter out others nodes.

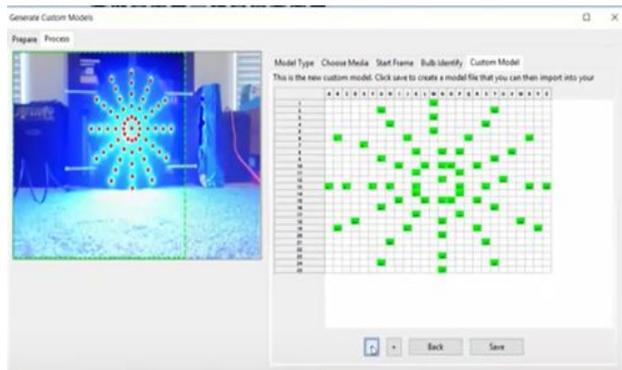
Click Next and the model that is generated is displayed.

 **Note:** Use the '-' and '+' keys to zoom out and zoom in to see the model.



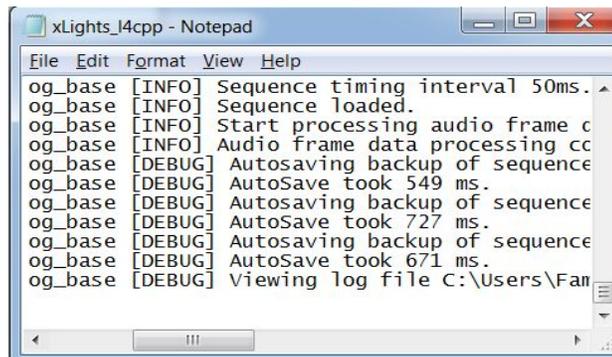
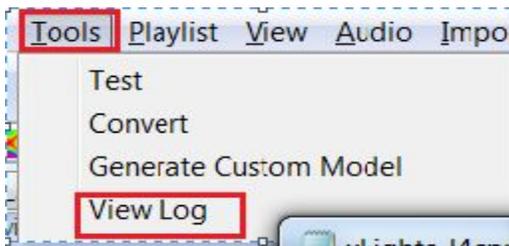
Click on Save to name and save the custom model.

Then use the Import Custom model function on the Layout screen to import the model that has just been created.



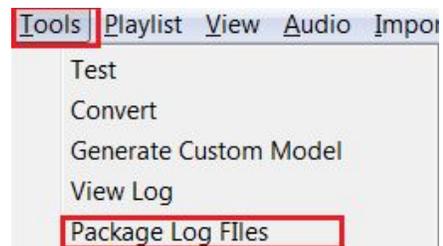
### View Log

The View Log option, enables a user to view the information / debug log that xLights maintains, if required to troubleshoot any problems and provide information when posting questions. Selecting the option will open up a text file using the default text file editor on your computer. Scroll to the bottom to view the latest messages that have been written to the log.



### Package Log Files

The Package Log Files option, provides functionality to package the required xLights xml and log files into a zip file which can then be provided for analysis. It is similar in content to the zip file created when a system crash occurs.





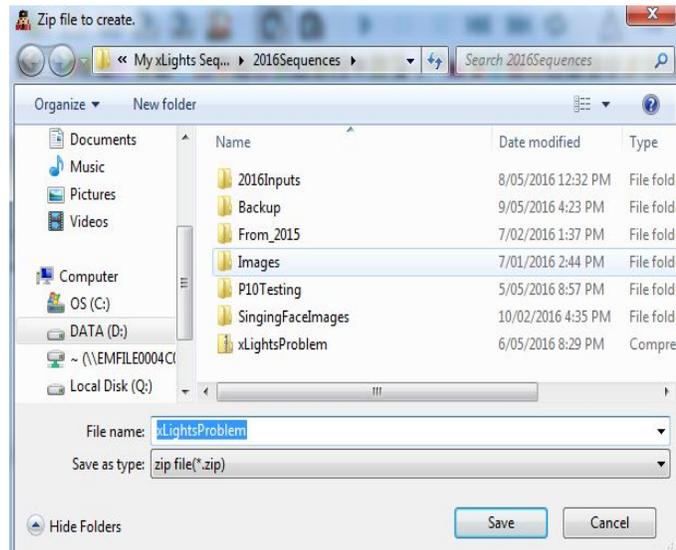
From the Tools menu, with the sequence that needs to be investigated open, select the Package Log Files option.

The required files will be zipped into a file 'xLightsProblem.zip' and you will be prompted to save it in the show directory.

You can change either the zip file name and/or the location before saving the file.

The zip file will contain the xLights network, rgbeffects, the sequence xml (if open is open) and a log file.

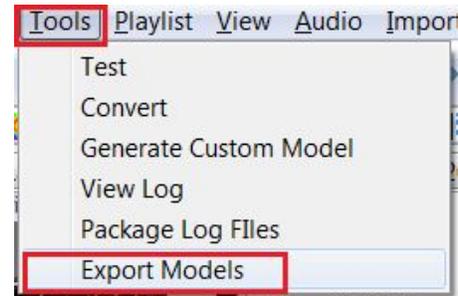
The zip file can then be provided to the xLights team for analysis.



### Export Models

The Export Models functionality creates a csv file with the details of all your models. Click on the Export Models menu item. You will be prompted for a filename and location to create the file in. Specify the filename and click OK.

A csv file will be created with a row for each model defined listing all the key attributes.



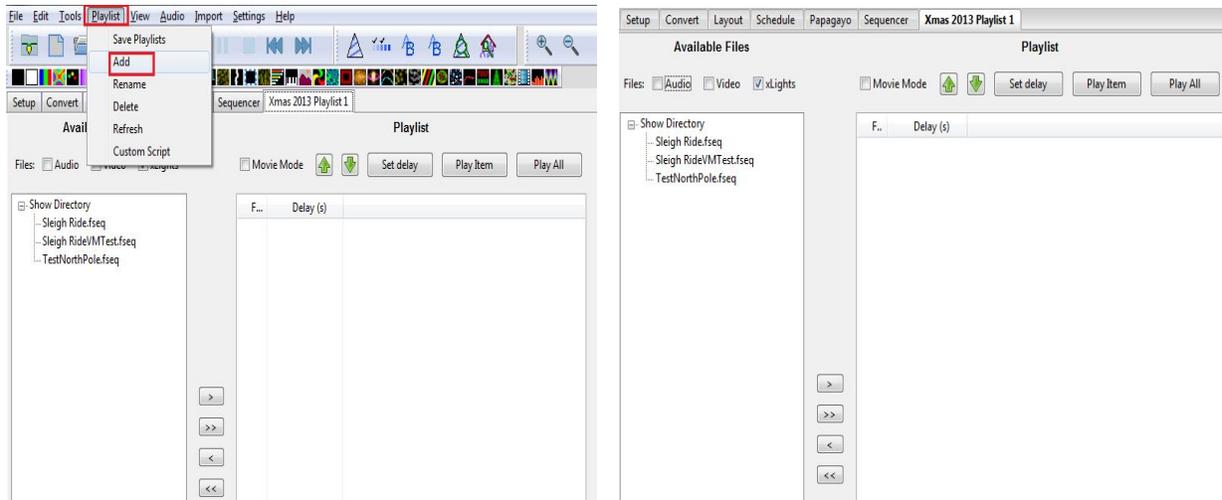


	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
				Channels				Start		End							Controller	
1	Model Name	Display As	String Type	String Count	Node Count	Per Node	Channel Count	Start Channel	Start Channel No	End Channel No	My Display	Controller Type	Controller Description	Output	IP	Universe	Controller Channel	Inactive
2	Arch1	Arches	GRB Nodes	1	25	3	75	6001	6001	6075	Default	E131		16	MULTICAST	21	1	FALSE
3	Arch2	Arches	GRB Nodes	1	25	3	75	6076	6076	6150	Default	E131		16	MULTICAST	21	76	FALSE
4	Arch3	Arches	GRB Nodes	1	25	3	75	6151	6151	6225	Default	E131		16	MULTICAST	21	151	FALSE
5	Arch4	Arches	GRB Nodes	1	25	3	75	6226	6226	6300	Default	E131		16	MULTICAST	21	226	FALSE
6	Arch5	Arches	GRB Nodes	1	25	3	75	6301	6301	6375	Default	E131		16	MULTICAST	21	301	FALSE
7	Arch6	Arches	GRB Nodes	1	25	3	75	6376	6376	6450	Default	E131		16	MULTICAST	21	376	FALSE
8	CandyCane1	Single Line	Single Color W	1	1	1	1	50	50	50	Default	E131	DMX	1	MULTICAST	1	50	FALSE
9	CandyCane2	Single Line	Single Color W	1	1	1	1	51	51	51	Default	E131	DMX	1	MULTICAST	1	51	FALSE
10	CandyCane3	Single Line	Single Color W	1	1	1	1	53	53	53	Default	E131	DMX	1	MULTICAST	1	53	FALSE
11	CandyCane4	Single Line	Single Color W	1	1	1	1	54	54	54	Default	E131	DMX	1	MULTICAST	1	54	FALSE
12	Garage Tree 1	Tree	RGB Nodes	3	18	3	54	75175	75175	75228	Default	E131		160	MULTICAST	200	175	FALSE
13	Garage Tree 2	Tree	RGB Nodes	3	18	3	54	75229	75229	75282	Default	E131		160	MULTICAST	200	229	FALSE
14	Garage Tree 3	Tree	RGB Nodes	3	18	3	54	75283	75283	75336	Default	E131		160	MULTICAST	200	283	FALSE
15	Garage Tree 4	Tree	RGB Nodes	3	18	3	54	75337	75337	75390	Default	E131		160	MULTICAST	200	337	FALSE
16	Garage Tree 5	Tree	RGB Nodes	3	18	3	54	75391	75391	75444	Default	E131		160	MULTICAST	200	391	FALSE
17	Garage Tree 6	Tree	RGB Nodes	3	18	3	54	75445	75445	75498	Default	E131		160	MULTICAST	200	445	FALSE
18	Garage-A1	Single Line	GRB Nodes	1	50	3	150	101	101	250	Default	E131	Test	2	MULTICAST	2	7	TRUE
19	IciclesL	Matrix	3 Channel RGE	1	1	3	3	56	56	58	Default	E131	DMX	1	MULTICAST	1	56	FALSE
20	IciclesM	Single Line	3 Channel RGE	1	1	3	3	59	59	61	Default	E131	DMX	1	MULTICAST	1	59	FALSE
21	IciclesR	Single Line	3 Channel RGE	1	1	3	3	62	62	64	Default	E131	DMX	1	MULTICAST	1	62	FALSE
22	Lantern1	Single Line	RBG Nodes	1	10	3	30	8240	8240	8269	Default	E131		22	MULTICAST	13	241	FALSE
23	Lantern2	Single Line	RBG Nodes	1	10	3	30	8270	8270	8299	Default	E131		22	MULTICAST	13	271	FALSE
24	Lantern3	Single Line	RBG Nodes	1	10	3	30	8300	8300	8329	Default	E131		22	MULTICAST	13	301	FALSE
25	Lantern4	Single Line	RBG Nodes	1	10	3	30	8330	8330	8359	Default	E131		22	MULTICAST	13	331	FALSE



## Playlist

Playlists are created to be used within the xLights scheduler if you plan on using xLights to run your show rather than the Falcon Player on a Raspberry Pi.



### Add

To create a new playlist, click on the Add button and provide name for the Playlist in the pop up window. A split screen will be displayed. On the left, the Available Files from the Show Directory are displayed. On the right, the Playlist and the items within are displayed.

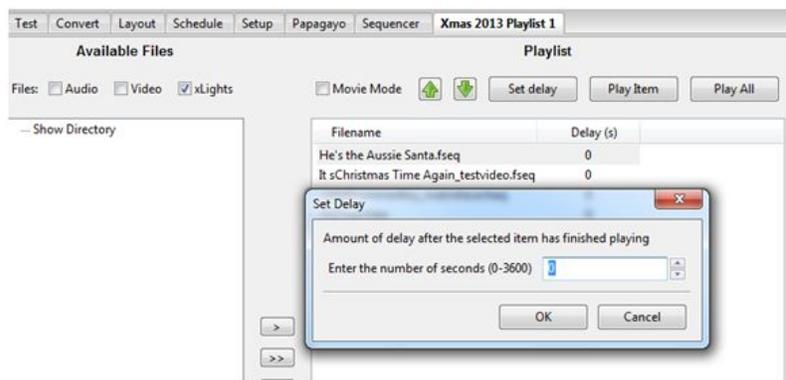
Filtering on the options against the Files line, enables xLights sequences, video and audio files to be selected from the Show Directory. Use the arrows provided to add / remove files (one or all files) from the Available File list to the Playlist. Within the Playlist section, use the Green arrows to change the sequence of the item.

In order to introduce a pause (i.e. delay) between items in the playlist, click on the item and then click the Set delay button.

Specify the number of seconds for the delay.

Click on Save Playlists to save the Playlist.

The playlist will be displayed as a tab next to the Sequencer tab.





### Rename

To rename a Playlist, click on the Playlist tab that you wish to change, then click on the Playlist tab, then select Rename. You will be prompted for a new name.



### Delete

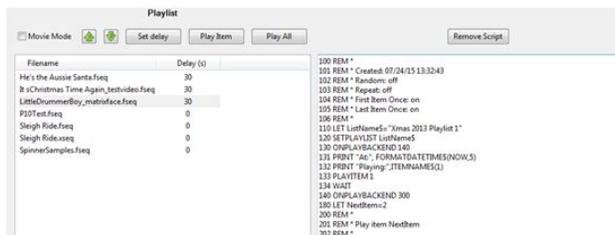
To delete a Playlist, click on the Playlist tab that you wish to delete, then click on the Playlist tab, then select Delete. You will be prompted to confirm the deletion. Click OK to delete or Cancel to return.

### Refresh

This option is used to refresh the screen with a list of Available files. To be used if you have just added any new Audio, Video or xLights sequence files to your show directory. Select Playlist and then Refresh.

### Custom Script

If this option is elected for a playlist, the BASIC language scripts used to run the playlist is displayed. You can then edit/ add custom scripts to perform actions such as send out RDS data, play a video etc.



You can also set Playback options for the Playlist as follows:





## View

The view menu enables you to zoom in or out on the sequencer view, define and use Perspectives and nominate which windows you want to have open.

### Zoom in

Selecting this option while on the sequencer tab will zoom in details on the sequencer grid.

### Zoom out

Selecting this option while on the sequencer tab will zoom out the details on the sequencer grid.

### Perspectives

Perspectives saves the location and size of the "windows" you use.

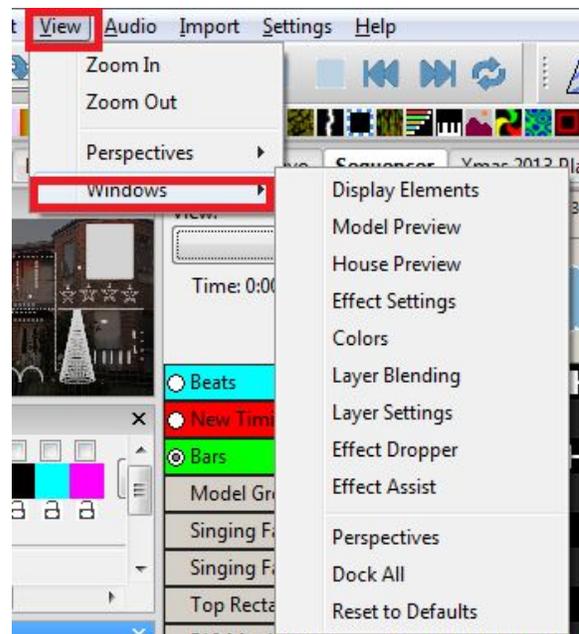
Particularly for dual monitor setups, it lets you move and size the Preview and Color windows away, giving you a bigger program area. Going to View / Perspectives / Save Current will store your settings to the currently selected perspective.



You can have multiple perspective saved and easily recall them by selecting the perspective desired from the Perspectives window.

### Windows

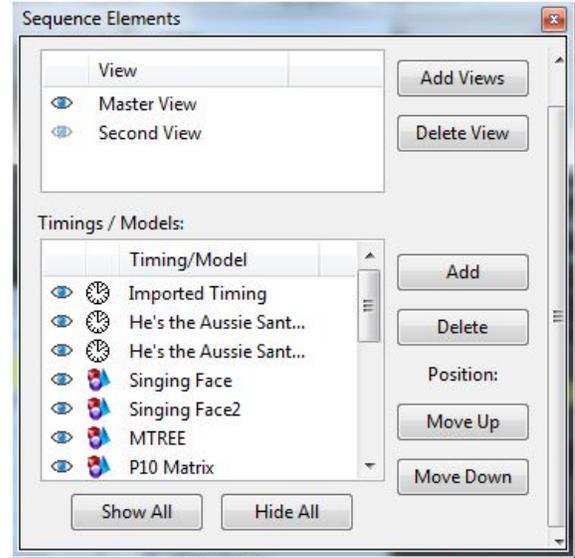
There are a number of windows that enable simultaneous display of different views in xLights. When xLights first loads, a default set of windows are displayed. Which windows are open can be controlled via the Windows menu by selecting View, Windows and then clicking on the required window to open it. The window is dropped by default on the left side of the screen, however each window can be moved and docked to alternate locations on the same screen or moved to an alternate display screen if connected to your PC/ MAC.





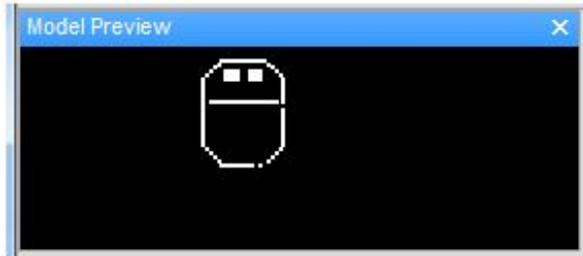
*Sequence Elements*

The Display Sequence Elements window enables views, Timings as well as models to be defined and updated. Functionality for these functions is described in the Views, Timings and Models section of this document.



*Model Preview*

The Model Preview window displays the effects on a model as the sequence is playing. With the window open, right click on the model name when on the sequencer tab and select Play model. It can also be opened/closed by clicking on the icon on the toolbar.



*House Preview*

The House Preview window displays the effects of your entire display where the model or model group has been assigned to the currently selected Preview window. Refer to explanations of multiple Preview windows in the Layout section. It can also be opened/closed by clicking on the icon on the toolbar

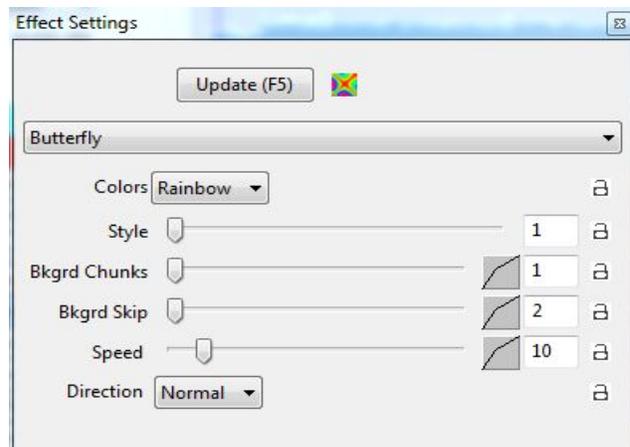


*Effect Settings*

The Effect Settings window displays the current or last effect that is being worked with. If an effect on the grid is selected or a new effect dragged to the grid, then this window gets updated with the 'current' effect.

Use the window to modify the attributes of the effect as required. The results of the change are displayed in the model window when selected and in the House Preview window when the sequence is played. .

The Value Curves functionality in this window has been covered under a separate topic entitled Value Curves.





**Tip:** It is possible to select a group of the same effects and change the settings of all of them all at once. For example you wish to increase 5 instances of the Circle effect to have the Number of Circles = 10. Select multiple instances of the effect by holding down control when you click on them.

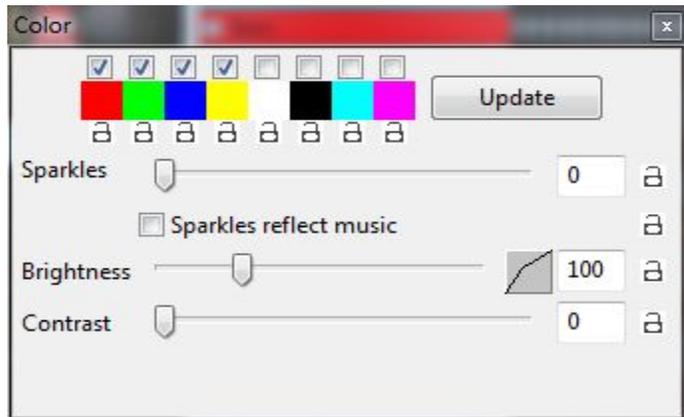
Change the Number of Circles setting to 10 , then click on the Update (F5) button in the Effect Settings window. The window can also be opened/closed by clicking on the  icon in the toolbar.

*Color*

The Effect Colors window enables the user to change the colors of the current effect that is being worked with. If an effect on the grid is selected or a new effect dragged to the grid, then this window uses the 'current' color.

Use the window to modify the colors of the effect as required. The results of the change are displayed in the model window when selected and in the House Preview window when the sequence is played.

The Value Curves functionality in this window has been covered under a separate topic entitled Value Curves



**Tip:** It is possible to select a group of the same effect type and change the color of all of them all at once. For example 5, spiral effects that are all on different models and need to be changed to the same color. Select multiple effects by holding down control when you click on them. Change the color palette then hit the Update button beside the colors. The window can also be opened/closed by clicking on the  icon in the toolbar.

By clicking on one of the colors, the color box will appear allowing you to choose or create any color you desire. To create a custom color, click on the Define Custom Colors >> button.



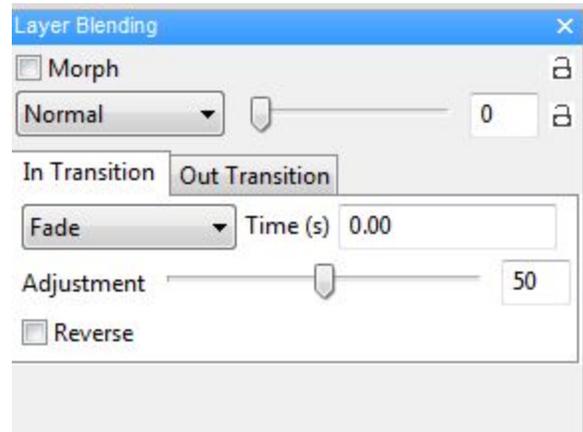


### Layer Blending



The first option of Morph is used with two or more layers. If selected, effect #1 will morph/blend/fade into Effect #2 midway through the timing interval in which the effects are placed.

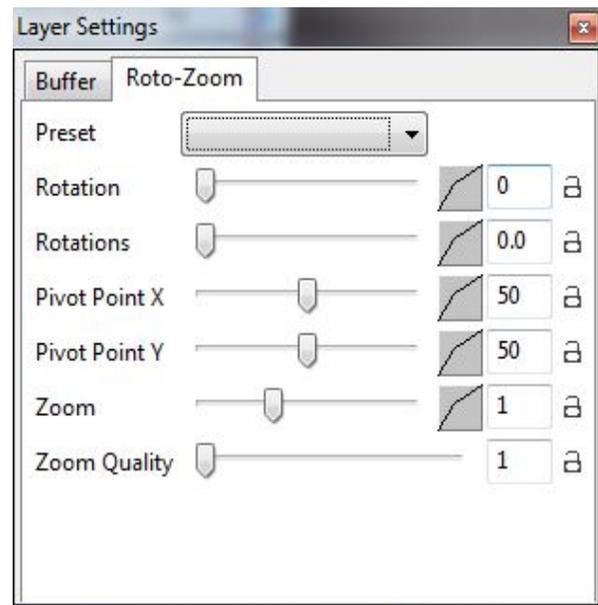
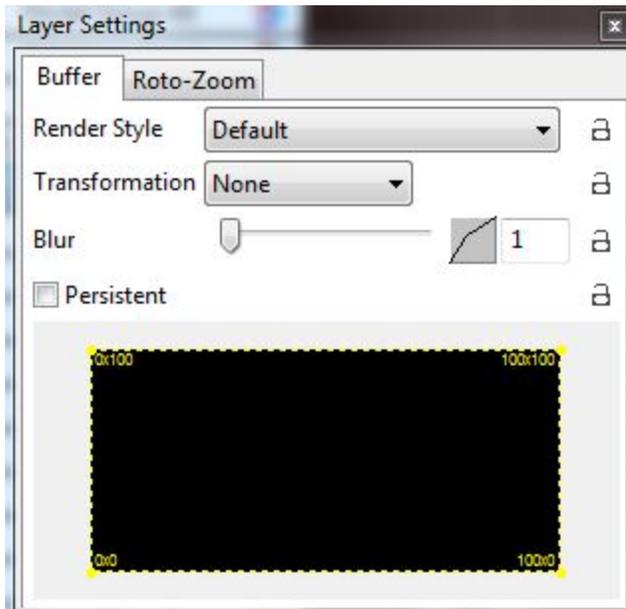
The drop down list has 12 different blending options.



### Layer Settings

The Layer Settings menu has two tabs .

The first tab (Buffer) defines how the effect will be adjusted during the render process in the buffer for the Model or Model Group.



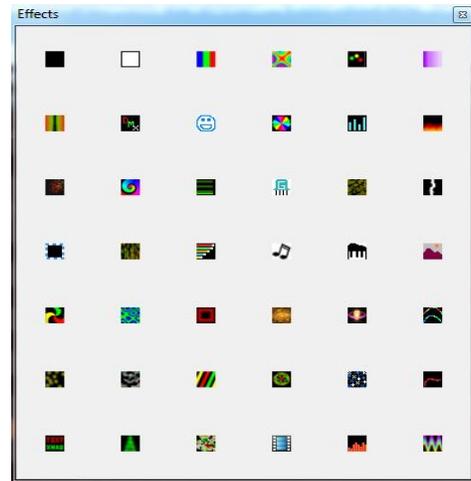
The second tab (Roto-Zoom) is used to apply the Roto-Zoom functionality to the model effect.



### *Effect Dropper*



The Effects Dropper window displays all the supported effects and enables you to select a required effect and drag it to the sequence grid.



The same functionality can also be obtained using the effects from the effects window as below:



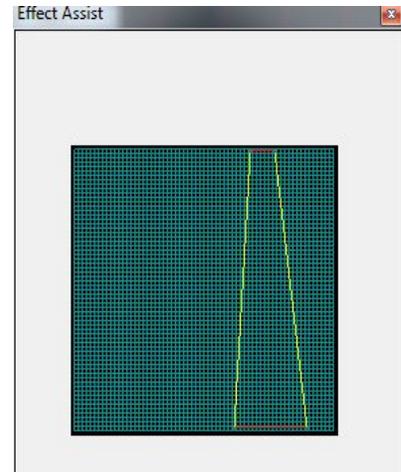
### *Effect Assist*

The Effect Assist Window is an additional window that helps you determine how an effects is being drawn via a panel view.

For example, if you open this window against a morph effect, the windows will display a grid corresponding to the x,y coordinates. If you then grab a slider for the morph effect and move it, the Effect Assist window shows exactly where the coordinate is being moved to, making it easier to determine what is being done to the effect.

You can also grab a corner of the image in the Effect Assist window and move it and have the slider values update in real time.

If you want single line morphs instead of area morphs then it's easier to just click with the left mouse button to establish the start points and click with the right mouse button to establish the endpoints. For areas you can either click and drag with either button or drag the handles.

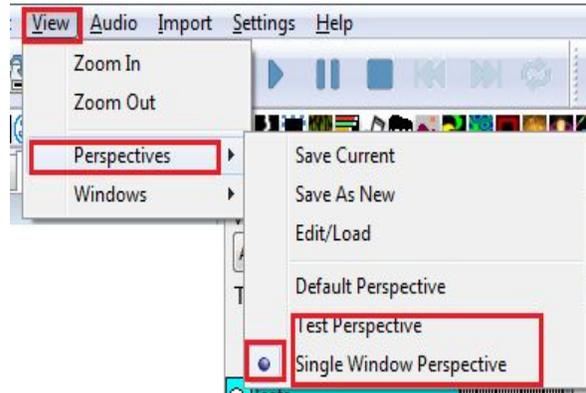




### *Perspectives*

The Perspectives Window enables you to save your current window positions and retrieve and use them later. So you can have a set of windows open for a single monitor, a different set when you have two monitors etc.

You can specify a name for each Perspective (Single Window Perspective, Dual Monitor Perspective etc). In order to do so, with the windows arranged as required, Click on Save as New. You will be prompted to specify a name. Click on Save to save it.

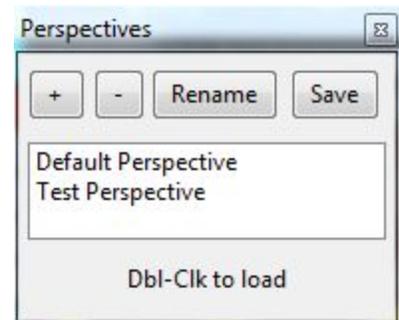


The solid circle to the left of the Perspective name indicates which Perspective you are using. To overwrite it, click on Save Current. You will be prompted to confirm that you wish to override the current perspective. Click on Save to save the Perspective.

Select a saved perspective and double click to load the required windows.

To load and use a different perspective or change/remove one, click on Edit/Load. Select the perspective and use the '-' button to delete it or Click on Rename to Rename it.

Double Click to load and use the perspective. You can also do this by selecting the perspective directly by clicking on its name in the previous window. To revert to the default perspective, click on Default Perspective in the previous window.





## Audio

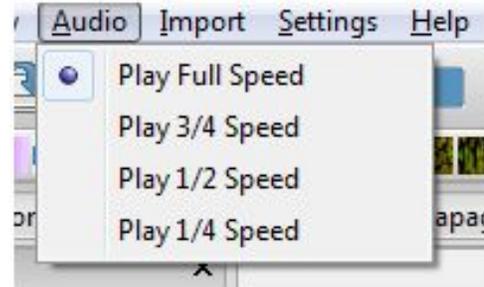
### Speeds

This function enables you to play the audio during sequencing at normal speeds or at slower speeds.

Click in the waveform and then select one of the speed options. Click Play. The audio will then be played at the selected speed and the vertical visual indicator will move along at the speed being played.

**Note:** As the speed is slowed the pitch of the song will get lower.

To return to normal speed, select Play Full Speed.





## Import



### Import Effects

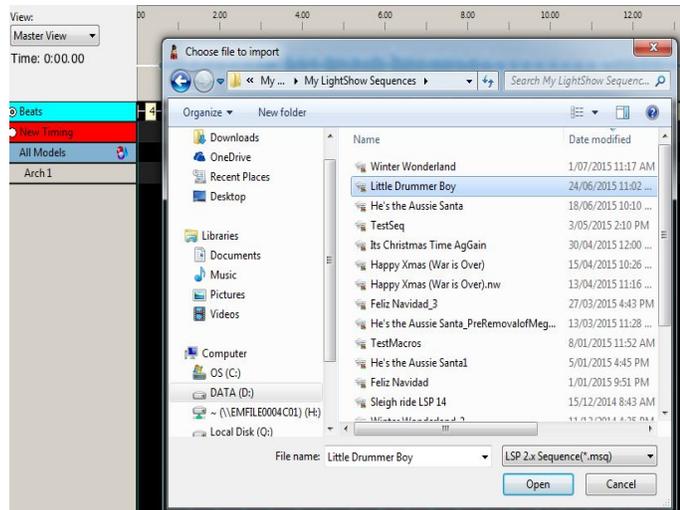
This option enables you to import sequences from other sequencers. However, in many cases it generates a large number of effects. In most cases, importing of RGB effects as Data Layers will suffice. There could be some cases (A/C channel data or LOR singing face sequences) where it is desirable to import using the Import Effects function.

The following example describes how to use this function to import an Arch effect from an LSP .msq sequence.

1. First ensure that you have created or opened an existing sequence that has the models added to the sequencer that you wish to import to.

**Note:** You must select a View first. If there are no models or groups displayed on the Sequencer, then you won't be presented with any models to import to.

2. Then click on 'Import Effects' from the Import tab and select the LSP sequence (the same process can be used for other supported sequence types from the drop down list).



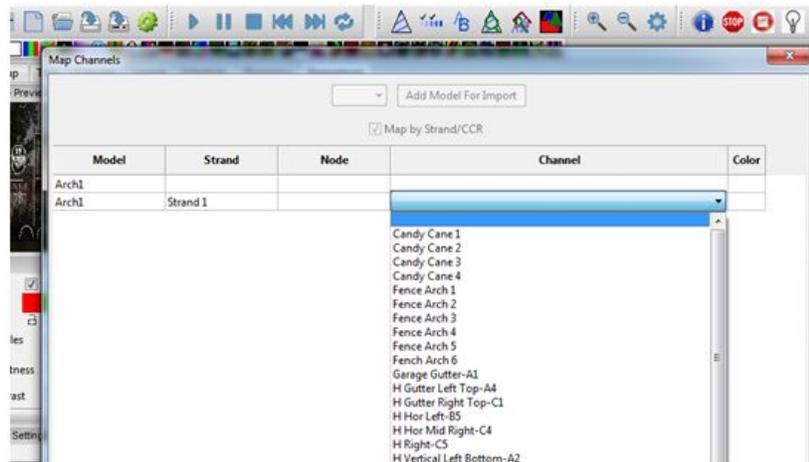
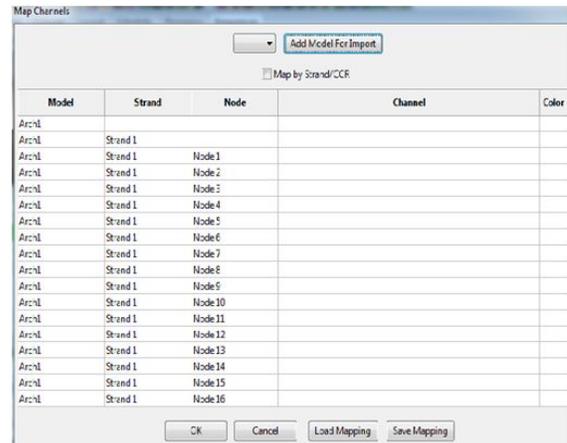
3. Click on the drop down arrow and you will be presented with a list of models that you have defined on the sequencer. Select a model and Click on the 'Add Model for Import' and press Enter. The following screen will be displayed.



**Tip:** Multiple models can be selected i.e. you can select another Model ('Arch 2') and Click on the 'Add Model for Import' again.



4. Tick the 'Map by Strand/CCR' option to select an entire strand (or multiple strands ) to import at a time. (Otherwise by not ticking the box, you can/must select individual nodes to import). The individual nodes will disappear and only the first two rows (i.e. model name and Strand name )will be displayed.
5. Double click in the Channel column against the row that says ' Arch 1 Strand 1'. You may need to double click more than once. A drop down list of LSP (or other sequencer) channels/controller /strands is displayed. Select the required channel/controller/strand.

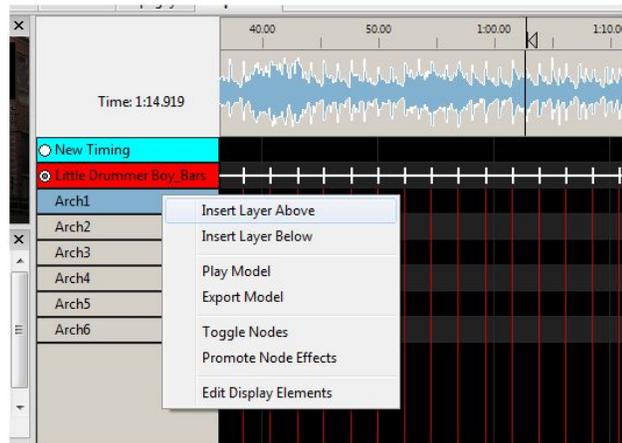


6. Select the required model and press enter. You can repeat this for multiple models
7. Click on 'Save Mapping' to Save the mapping. The mapping can then be reused by clicking on the 'Load Mapping' button the next time.
8. Click on 'OK' when ready.
9. A status message will be displayed at the bottom indicating that the sequence has been imported.
10. Click on the 'Render All' button.
11. Click on Play.
12. Save the sequence as per usual.



**Tip:** In order to Improve performance of the imported effects and reduce the memory footprint, in the sequencer tab, right click against each of the imported model names and select 'Promote Node Effects'.

This will search through the node level 'On' and 'Color Wash' effects and if the same effect is on all the nodes at the exact same times, it will be removed from the nodes and placed on the Model.



### Importing a LOR Sequence

Importing a LOR sequence follows the same steps as described above. However, depending on the LOR hardware setup, channel definitions in LOR and correspondingly in xLights need to align. See discussion within chapter 6, Coming Over from LOR.

### Importing an xLights Sequence

This process can be used to

- Import effects from a xLights sequence from another user
- Import effects from another of your (e.g. older) xLights sequence into an existing xLights sequence

#### Step 1

If the xml sequence has been received from another user, it is preferable to have both the shared sequence xml file and the xlights\_rgbeffects.xml file from the donor.

Create a new directory and copy the sequence file and the xlights\_rgbeffects file to that directory. Change the show and media directories to point to the new directory.

If you have the xlights\_network.xml file (which contains the network setup details) copy that to the new directory too, otherwise setup a block of universes large enough to cover the sequence channels (e.g. 20,000 NULL).

Copy the music file to the new folder. (If the music has been edited and you own the original music it is ok for you to have a copy of the edited file).

Open the sequence, click on Render All or Save and then play it. You should be able to see how the lights flow in the layout window. Study the sequence and determine which models you wish to copy to your own models.



**Tip:** Print out the model names from the shared sequence as you will need to know those when you import.

Look for the correct quantity of elements in the donor sequence that will match your elements. For example If you have 4 windows but the donor sequence has 8, pick the 4 windows that you want to copy.



Make a note of the names of each donor model you want to copy to a model of your own layout. Watch the sequence several times.

### Step 2

Copy just the xml file of the donor sequence to your own show directory.

Make sure you have the appropriate music file in your own media show directory. Close the sequence you were watching, go to the setup tab and change the show and media directories back to your own directories.

If importing into a new sequence, then

- Create a new musical sequence, select timings and add your display elements or select a view.
- Save the sequence.

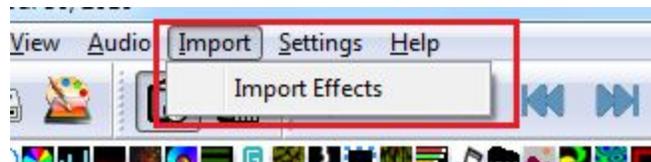
Else

- Open the sequence you want to import into, add your display elements or select a view.

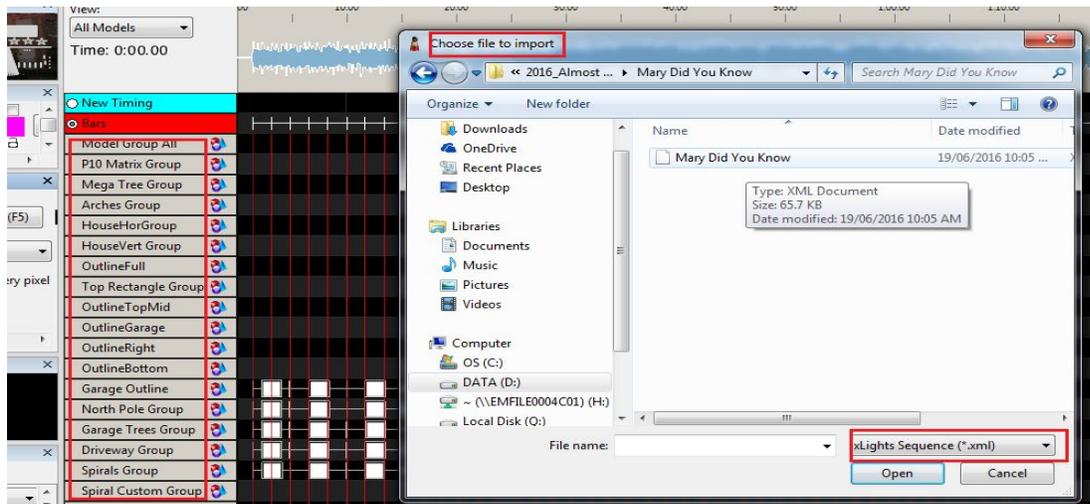


**Tip:** Ensure that your models are in your sequencer view before you start the import, else you won't have any models to import into.

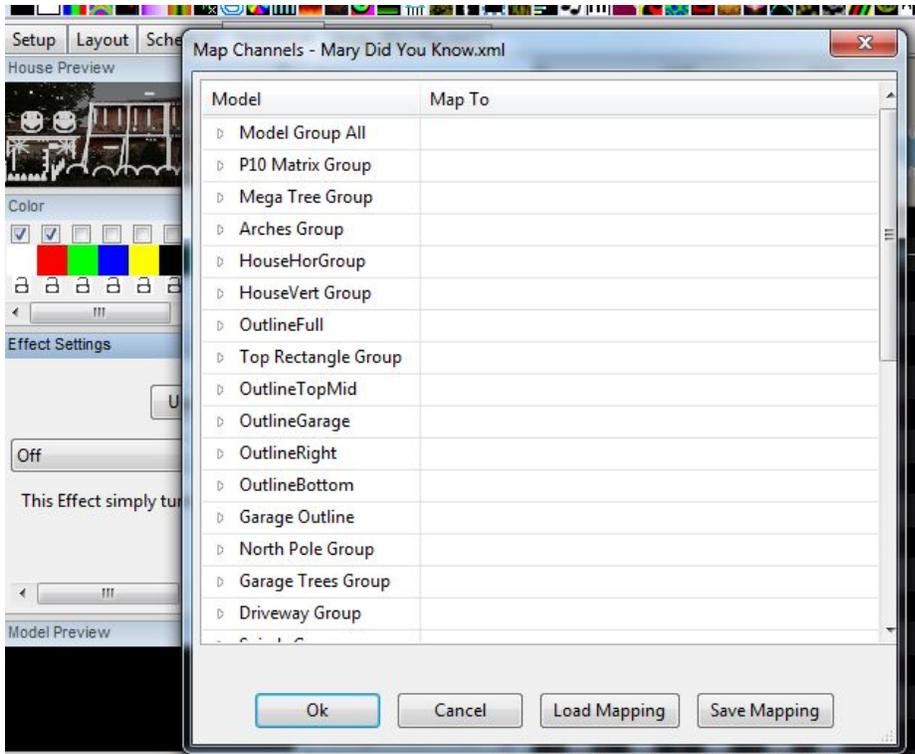
Select Import, Import Effects



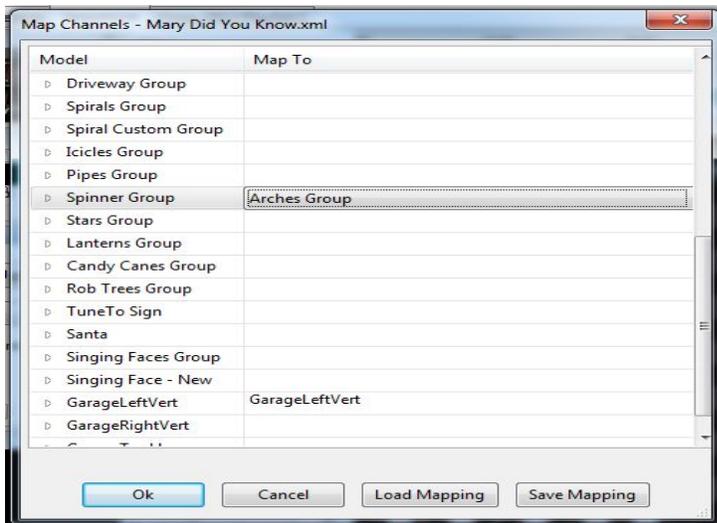
Select a type of 'xml'. Select the donor sequence xml.



A model mapping window is displayed containing two columns. On the left are the models and model groups from the sequencer tab. Double click in the 'Map To' column in the row that you want to import the model. You may have to click or double click a couple of times before a window with the list of models / model groups from the donor xml is displayed.



Select the model group and then repeat for other models model groups.



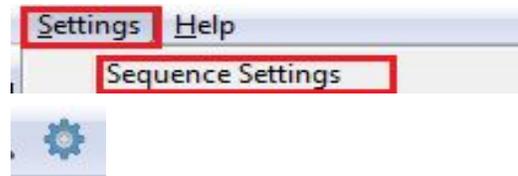
Click OK when done. You can save the mapping and load it at another time.



## Settings

### Sequence Settings

Select the Sequence Settings option from the Settings menu. This screen can also be accessed by clicking on the button of the toolbar. The Sequence Settings screen has four tabs.

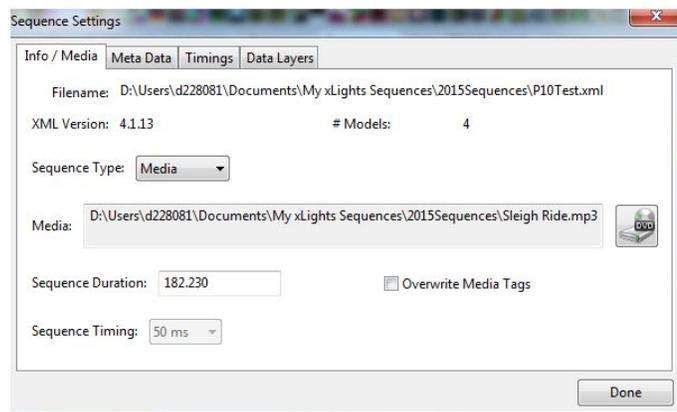


#### Info/Media

The Info/Media tab displays information about the sequence including the xLights release that was used to create the sequence, the number of models saved, the Sequence Type (i.e. Media or animated), if media has been specified then the name and location of the media file. The sequence duration, the sequence timing and whether the media tags should be overwritten.

The sequence type, media file name or location, the sequence duration and whether media tags can be overwritten can be changed from this tab after the sequence has been created.

If you have reduced the length of the media file after starting on the sequence, and want the sequence to adjust to the new length or if you want to change the default length of an animation:



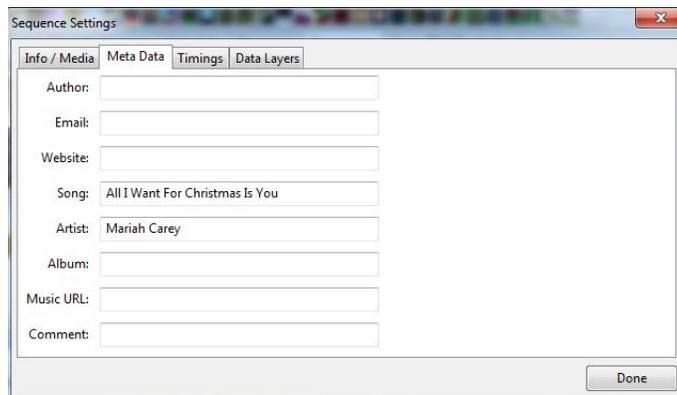
Change the length of sequence duration to the new value, then save the sequence. Delete the fseq file, close the sequence, re-open it and save (creating a new fseq file).

#### Metadata

The Metadata tab enables the media metadata to be entered or updated. The attributes supported are the author, email, website, song, artist, album, music url and a comment.

This information does not drive any functionality in xLights.

xLights will parse and retrieve the information from the media file. It won't update any information entered on the media/info screen unless the Overwrite Media Tags setting on the Media/Info screen is ticked.



After updating any data Click on Done to Update.



### Timings

The Timings tab enables you to create or import one or more sets of timing marks on timing tracks for the audio of your sequence.

This screen is part of the flow when creating a new sequence or can be accessed via this tab at any time after creating a sequence to add additional timing tracks.

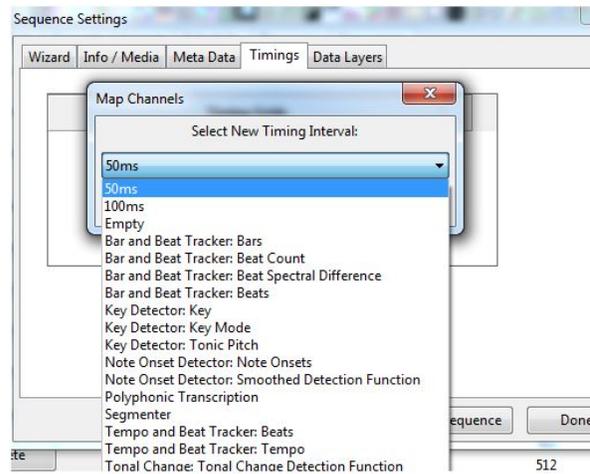


### New

Clicking on New will present you with a list of options. You can either select a fixed value such as 50 or 100 ms or select from one of the options in the list.

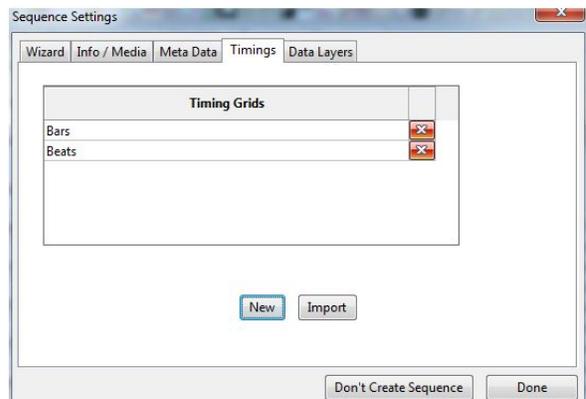


**Note:** This component uses the VAMP plugins to generate the timing marks.

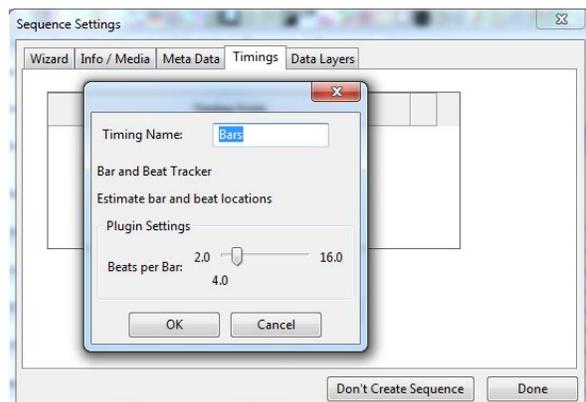


Selecting one of the options then presents a window where you can either select the defaults or change the timing name or any of the plug-in settings.

Click Ok and the audio track will be analysed and a timing track will be created. You can then click New again to select another timing track ('Beats') to be created



Click Done when complete.

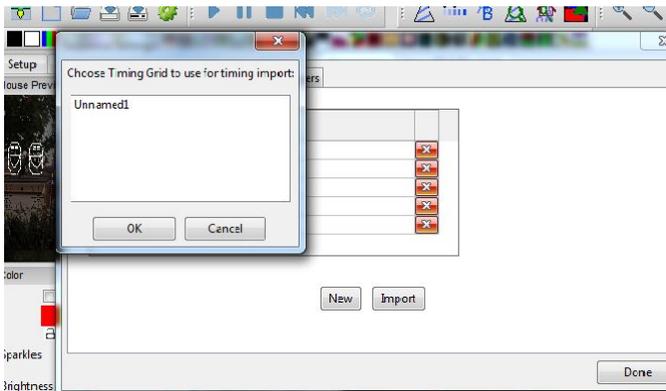
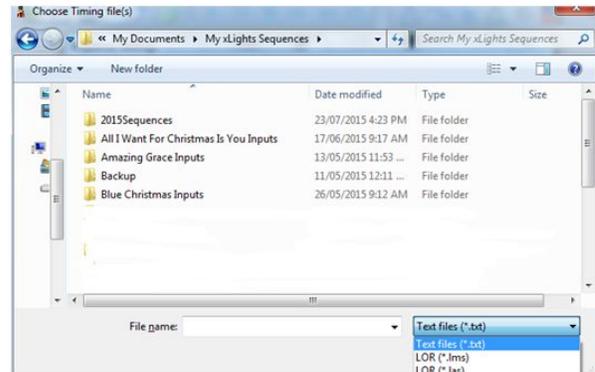




## Import

The Import button enables you to import timing marks created externally for example using Audacity or where you have created a timing track manually or wish to import one from another sequencer in a supported format.

You will be presented with a window to navigate to and select a file containing the timing marks to import to the timing grid. This can be a text file (.txt), a LOR lms file or a LOR LAS file.



Select the required file, click OK to import the timing grid marks. If you select a LOR LMS or LAS file and it has timing marks in it, you will be prompted to select the timing grid from within a window:

You can repeat this process to import another timing grid from the same file or from another file. Click Done when complete.

## Data Layers

When should you use the data layer to import effects?

Typically if you have sequences from other sequencers such as LSP, LOR, Vixen, HLS that you wish to use within xLights. The imported sequence is mapped very efficiently as a data image rather than individual effects. After importing the sequencer you can:

- Save it ( an .fseq file is created) and run it within xLights or via the Falcon Player
- Add xLights effects to new models via the sequencer
- Selectively override some of the effects from the imported models within xLights.

You cannot however 'edit' any of the imported effects directly. In order to do that see the Import Effects function. The data layer embeds the CONVERT tab into the sequence. The process is used to convert an incoming file from another sequencer into an \*.iseq file. Therefore, Vix, Lms, Seq, and Hls data into an ISEQ file.

This conversion is done in two places.

- When you import a data layer
- When you press the 'Render All' button



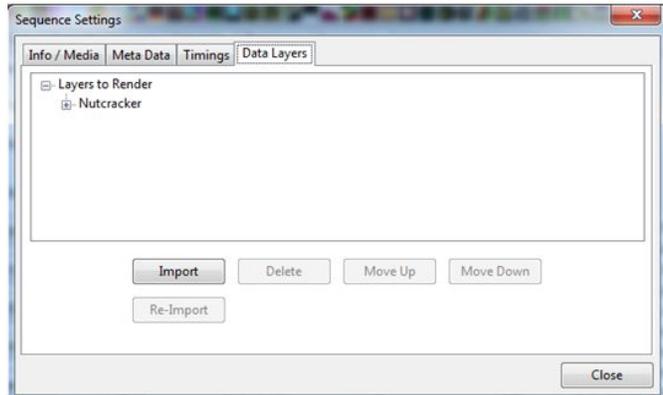


**Note:** The purpose of 'Render All' is to render all the effects and data layers to the sequence object without saving to disk. The already imported ISEQ file data is used. If the source ('LMS', 'SEQ', 'HLS' etc) file is changed, then you need to go to the Data Layer tab, click on that layer and select the Re-Import function.

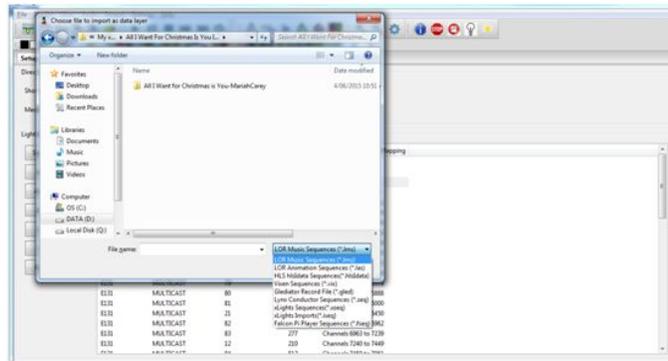
Import

Before using this function, a new sequence should have been created or an existing sequence opened.

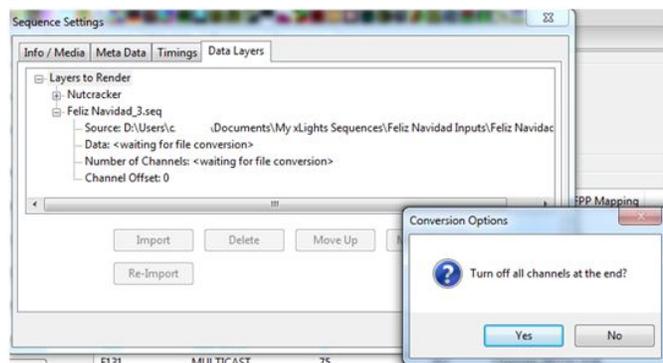
From the Main Menu tab, select Sequence Settings and then Data Layers.



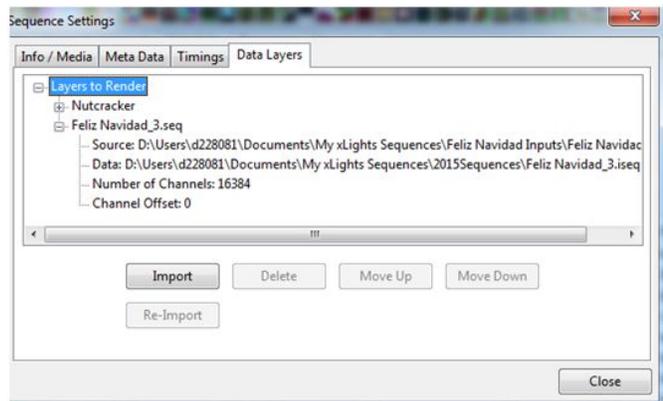
Click on Import, navigate to where your input file ('LMS', 'LSP' etc) is, change the file type as required and select the file to be imported. Click ok.



On completion of the import, the Data layer details and the number of channels imported to the data later will be displayed. The file has been imported/converted and stored in an .iseq file.



The normal (and default) option is for the xLights 'layer' to be on the top and the imported sequence data represented below it. When rendered, the data is rendered from the lowest layer upwards, so the xLights effects will be rendered last. (Refer to discussion under Move Up/Move Down).



On the Main Menu, click on the 'Render All' button, after which the sequence can be played.



Click on the 'Save' or 'Save All' buttons to save the sequence.



**Tip:** You must click Render All or Save the file after the Import function is complete, the data is not automatically rendered.



**Tip:** To view the details of the data that has been imported, double-click on the model's row title to reveal the strands and then the nodes. The imported effects are at the node level.

### *Delete*

Use this function if you wish to delete a data layer that has been created via the import function. Select on the layer and delete.

### *Move Up/Move Down*

While the most common use of this function is to import effects from a previous sequencer once per sequence, you can import multiple layers to be rendered at the same time. An example of this is where you may have two purchased LOR (or other) sequences for a mega tree singing faces. Or you may have xLights effects on a whole house model which you then want to be 'overridden' by the imported data layer.

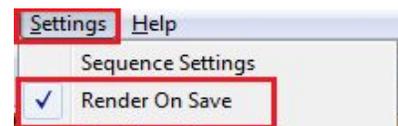
Using the Up/Down buttons allow you to determine which layer will take precedence over the others. The highest layer will render last i.e. on top of the others and so forth.

### *Re-Import*

Use this function, if you wish to re-import and overwrite an imported data layer. Normally required if the source i.e. LSP, LOR sequence has been amended in any way and you wish to overwrite the previous import without affecting any other effects that may have been added to the sequence within xLights. Select the data layer and click on the re-import function, after which, functionality is the same as the Import function.

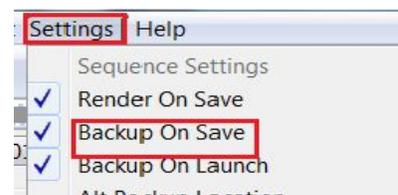
## Render On Save

The default setting is to render all the effects of all the models and groups when saving the xml. If this setting is unticked (i.e. to turn off), then it will only save the sequence xml when you click Save/Save As, resulting in a very fast save operation. Then you can render using the Render All button when you really need to create an fseq file or need to make sure what you are previewing is fully up to date.



## Backup On Save

With this setting activated, xLights will perform an xml backup (similar to a user pressing F10 to manually backup) each time the sequence is saved - when the user clicks on Save or Save As.

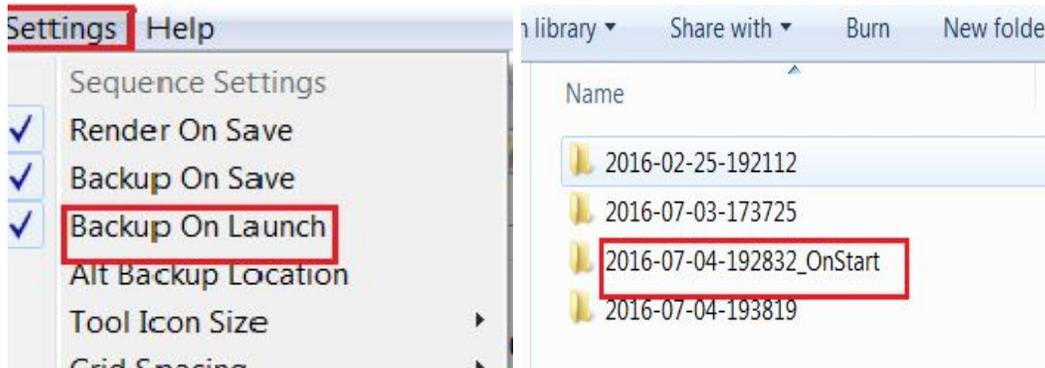




The existing files, including the saved sequence xml, will be backed up to the Backup folder in your show directory prior to the render executing and fseq file being created.

### Backup On Launch

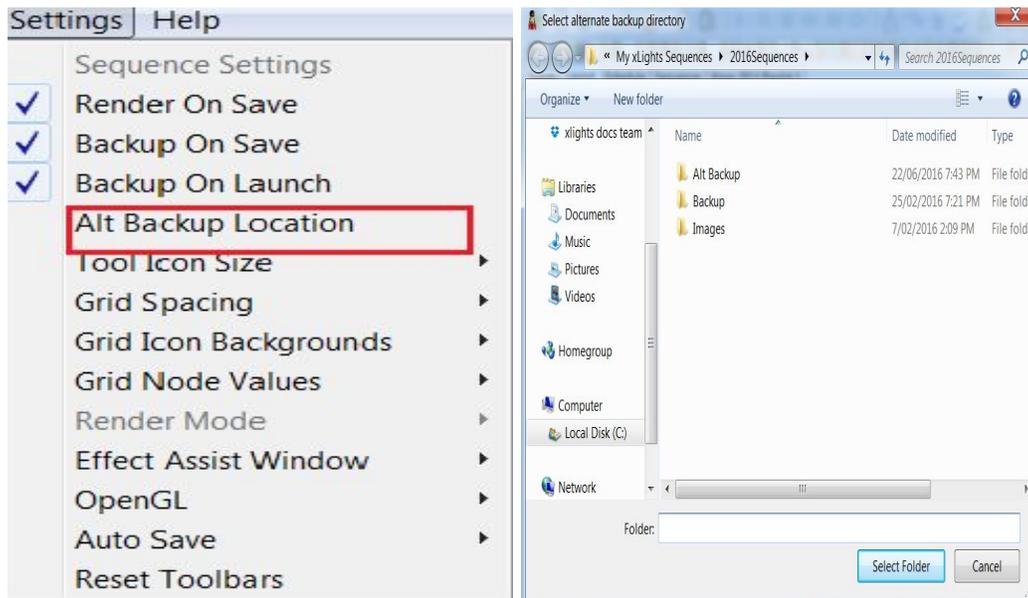
With this setting activated, xLights will perform an xml backup (similar to a user pressing F10 to manually backup) each time xLights is launched. The existing files will be backed up to the Backup folder in your show directory, prior to the application launching and updating any xLights files when it is launched. The Backup sub directory created will have a suffix of ‘\_OnStart’ added to the folder name.



### Alt Backup Location

The Alt Backup functionality (pressing F11 instead of F10) creates a backup folder in a location of your choice that you specify the first time you use the function. If you wish to change the location, then you can do so via this option.

Click on it and a window is presented to select an alternate location. Navigate to the location and select the folder. Click on Okay. This location will henceforth be used for the Alternate backup function



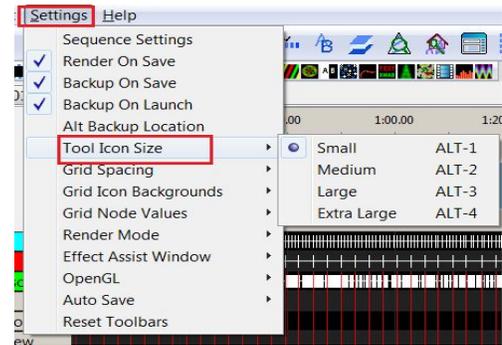




### Tool Icon Size

This function enables you to change the size of the tool icons that are used to represent the effects on the effects ribbon.

Four options are available:

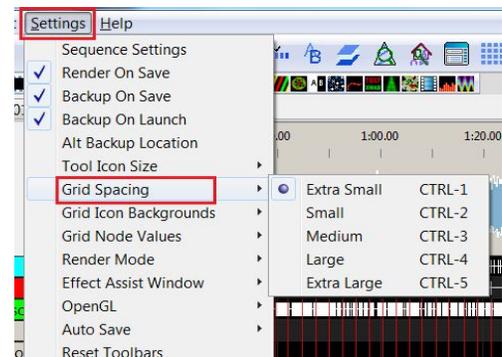


### Grid Spacing

This function enables you to change the size (i.e. width of each band) of the sequencer grid.

Five options are available:

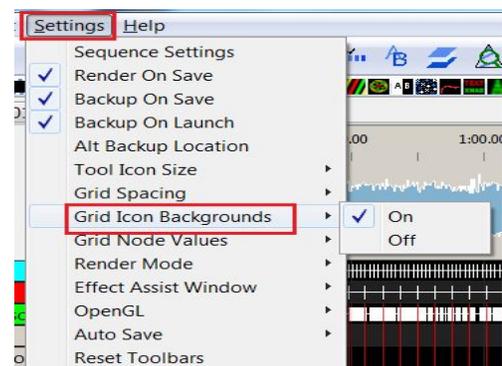
- Extra Small
- Small
- Medium
- Large
- Extra Large



### Grid Icon Backgrounds

When an effect such as the Morph effect is placed between timing marks (as an example over several seconds long), a representation of the color changes over time for that effect.

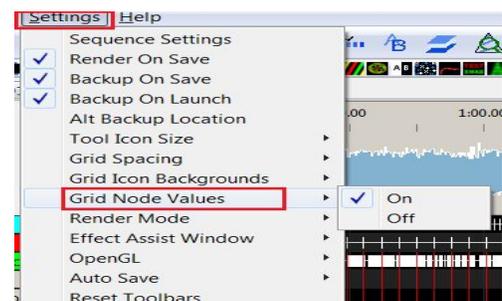
If you select Off, then the effect on the sequencer grid will only show the generic effect icon and not the colors. Not all effects have this difference.



### Grid Node Values

This function provides the ability to turn off the effect displaying colors at the node level.

Turning it off improves rendering performance and is recommended where effects are only being dropped at the model level. The value can be turned back on as required.

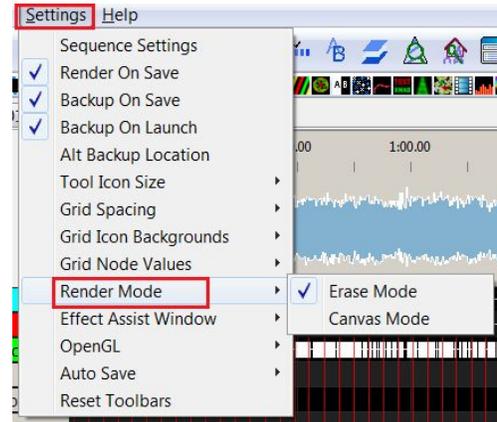




## Render Mode

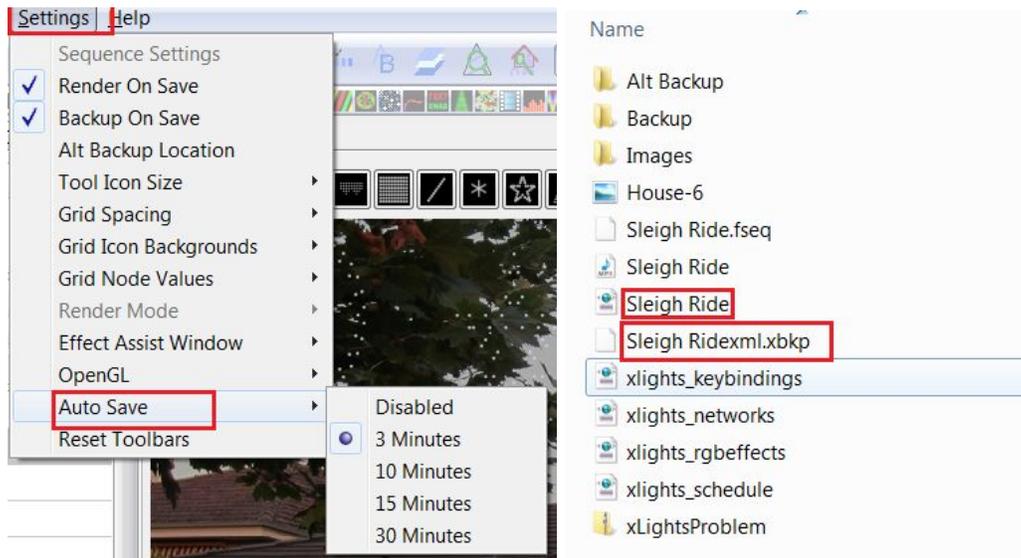
If the Render Mode is set to Erase (which is the default value), then the fseq file is erased before every render. If set to Canvas Mode, then the data in the fseq is not cleared before a render, rendering is done over the old data.

 **Note:** If set to Canvas mode, deleting an effect will still show when played until it is overridden with a new effect. Imagine a 6 foot painting in which you paint over a 4 foot section. The 2 foot original section is still visible. This is the how canvas mode works.



## Auto Save

The Auto Save functionality creates a copy of your working sequence xml, in your show directory. By default, the open sequence will be saved every 3 minutes and will create or override a file 'XXX.xml' where 'XXX' is the name of your sequence. You can use this menu to change the timeframe this occurs at or to disable it. The '\*xml.xml' files will also be included when you press F10 to back up your xml files from the show directory. It won't be included if F11 is used to back files up to an alternate location.



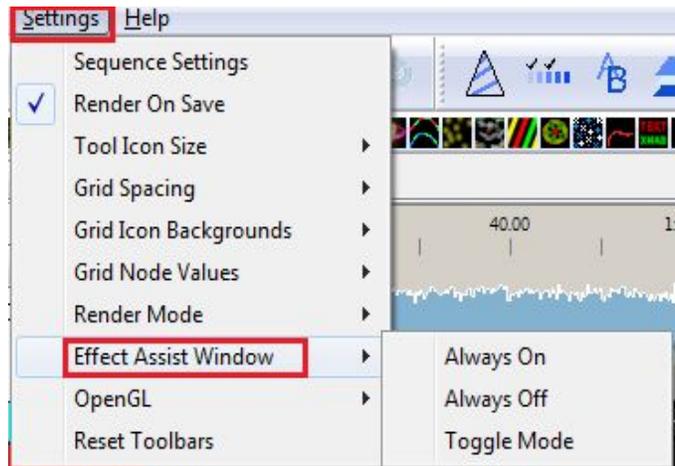
In order to recover your sequence file from an unexpected error or corruption to the point when the last autosave executed: ensure that xlights is not active. Then rename your existing sequence file ('xxx.xml') to another name and rename the 'xxx.xml' file to 'xxx.xml'. Restart xLights, open the sequence and Click on Render All.



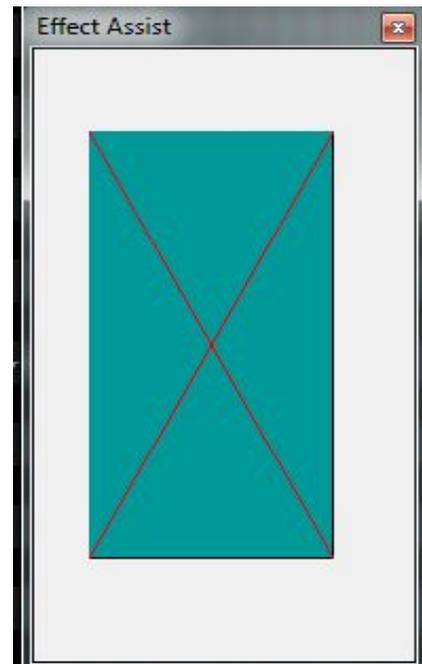
## Effect Assist Window

Always On will display the window in all cases, Always Off won't display the window and Toggle Mode will display the window if the effect supports it, else won't display the window if the effect does not have this capability.

Click on an effect in the sequencer grid and expand the Effect Assist window.



If Always on is selected and the effect is not supported by this window, then you will see a red X in the window.

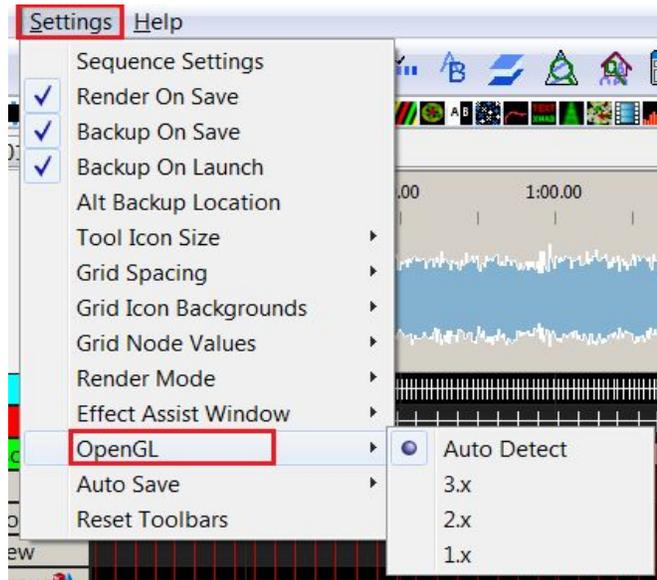




## OpenGL

The OpenGL setting is used to define what version of the OpenGL API is being used for certain components of xLight rendering of 2D and 3D graphics.

This option does not have to be used unless you see issues with the waveform or icons not being displayed or the sequencer is jerky. In which case, starting with 3.x and working downwards, select an option and restart xLights and check the results. Advise the xLights team, as it could be that your video card drivers on your computer need updating.

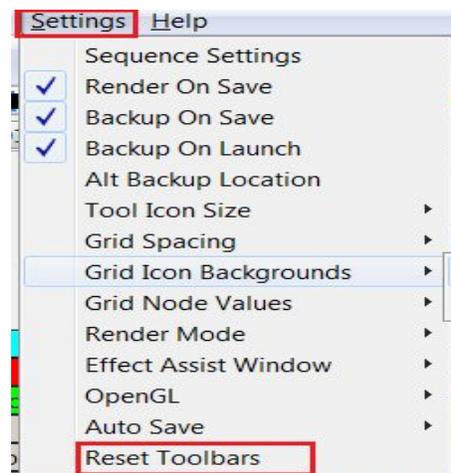


## Reset Toolbars

The Reset Toolbar option, when selected will reset the Toolbars to the default locations the next time xLights is started. A restart of xLights is required for it to take effect.

This option should be used if you find that you are missing an icon from the toolbar. This can occur when a new icons is added to the toolbar, as the toolbar icon positions are stored in your xLights\_rgbeffects file.

You can also shift the toolbar icons to reveal any new missing icons.



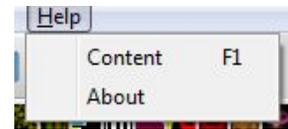


## Help

The help tab contains two options within it.

Pressing F1 displays a Help or information window depending on tab the user currently is on.

Selecting the About option display a window containing xLights release information, websites, copyright and acknowledgements.





## Chapter Six: Advanced Features

### Configure Matrix Panels

**BBB definition**

### Coming From LOR

**Running LOR Controller in DMX Mode**

*LOR to DMX channel conversion*

**Running LOR in DMX Mode**

**Convert a LOR LMS file, play on non LOR hardware**

**Convert a LOR sequence, import into xLights**

*Model definition*

*Import sequence data*

**Common Scenarios**

### Editing the rgb.xml file

**Using Notepad++**

**The rgb.xml effects file**

### Online Support Groups



## Configure Matrix Panels

In this example, the setup consists of 8 P10 panels (4H x 2 W) driven via a Beagle Black Bone (BBB) with an octoscroller running the Falcon Player (referred to as the FPBBB).

Define a model 'P10Matrix' (or any name of your choice) as a horizontal matrix.

Set '# Strings' = 64 (corresponds to number of rows), 'Lights/String' as 64 (corresponds to the columns) and 'Strands/String' = 1. Starting corner = Top Left.



**Note:** A single 32 \* 16 P10 panel has 16 rows (height) and 32 columns (width). Right click on the image in your Layout and select Node Layout to view the node definition.

The start channel has been set to **11800** (this will vary for your channel configuration) and Start Channel is set to **1**. xLights will automatically calculate the end channels.



**Tip:** The starting corner must be set to Top Left irrespective of how you configure or connect your panels on the BBB.

Name	P10 Matrix
<b>Matrix</b>	
Direction	Horizontal
# Strings	64
Lights/String	64
Strands/String	1
Starting Location	Top Left
<b>Indiv Start Chans</b>	<input type="checkbox"/>
Start Channel	11800
Strand/Node Names	--Click To Edit--
Faces	--Click To Edit--
Dimming Curves	--Click To Edit--

On the xLights Setup tab, what you define is not relevant as that information is not carried over to the FP BBB. Therefore you can define them as E1.31 or define a block of channels of type NULL.



**Note:** If wishing to use the Falcon Player in Bridge mode, then the channels pertaining to your matrix must be defined (as below) and match your model i.e. they cannot be left blank.

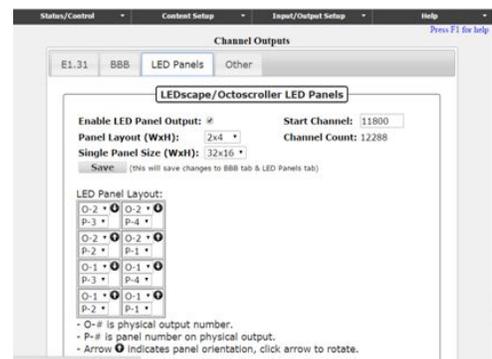
Network Type	Port	Baud Rate or E1.31 Univ	Num Chann...	xLights/Univ/FP Mapping	Enable
E1.31	MULTICAST	30	512	Channels 11800 to 12311	Yes
E1.31	MULTICAST	31	512	Channels 12312 to 12823	Yes
E1.31	MULTICAST	32	512	Channels 12824 to 13335	Yes
E1.31	MULTICAST	33	512	Channels 13336 to 13847	Yes
E1.31	MULTICAST	34	512	Channels 13848 to 14359	Yes
E1.31	MULTICAST	35	512	Channels 14360 to 14871	Yes
E1.31	MULTICAST	36	512	Channels 14872 to 15383	Yes
E1.31	MULTICAST	37	512	Channels 15384 to 15895	Yes
E1.31	MULTICAST	38	512	Channels 15896 to 16407	Yes
E1.31	MULTICAST	39	512	Channels 16408 to 16919	Yes
E1.31	MULTICAST	40	512	Channels 16920 to 17431	Yes
E1.31	MULTICAST	41	512	Channels 17432 to 17943	Yes
E1.31	MULTICAST	42	512	Channels 17944 to 18455	Yes
E1.31	MULTICAST	43	512	Channels 18456 to 18967	Yes
E1.31	MULTICAST	44	512	Channels 18968 to 19479	Yes
E1.31	MULTICAST	45	512	Channels 19480 to 19991	Yes
E1.31	MULTICAST	46	512	Channels 19992 to 20503	Yes
E1.31	MULTICAST	47	512	Channels 20504 to 21015	Yes
E1.31	MULTICAST	48	512	Channels 21016 to 21527	Yes

### BBB definition

On the LEDScene/Octoscroller LED Panel page, Enable LED panel must be ticked.

Start channel is 11800 – (This must match the model definition in xLights)

The panel layout is 2 x 4. The channel count is calculated. The vertical arrows correspond to the Up/Down physical setting of the arrows behind the panel. P1 for each output is the panel that the output from the Octoscroller is connected to. On the E1.31 page, the Enable E1.31 should not be ticked. The channels and universes must however be defined on the E1.31 page.



**Note:** If wishing to use the Falcon Player Bridge mode, then 'Enable E1.31' needs to be selected.



## Coming from LOR

### Running LOR Controller in DMX Mode

#### *LOR to DMX Channel conversion*

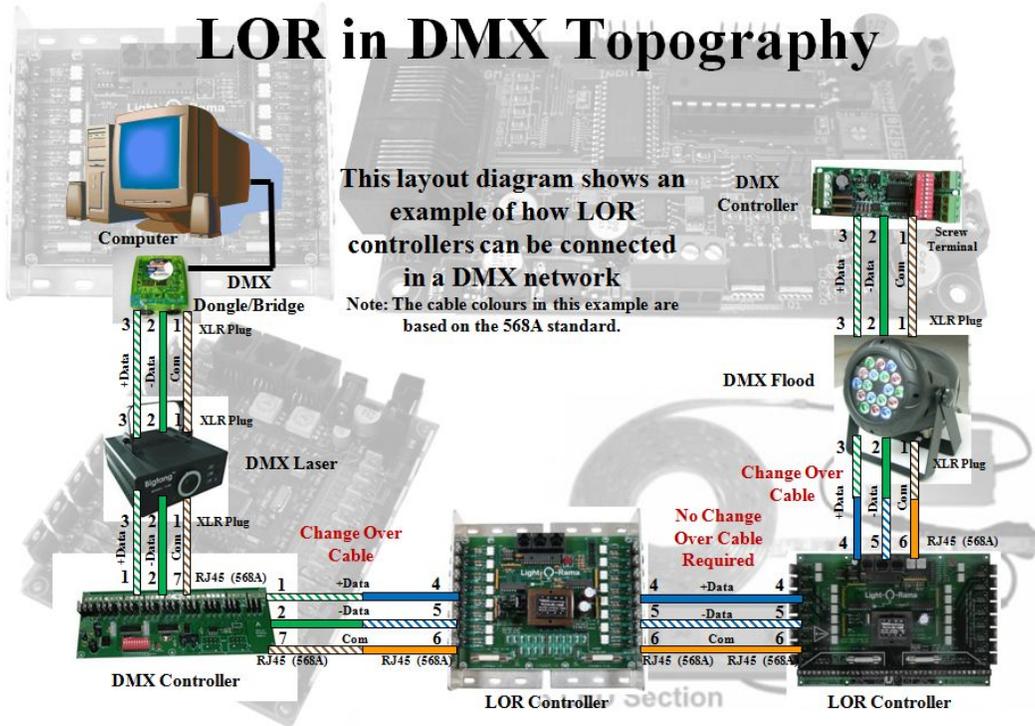
The following table describes the conversion of a LOR Unit id to a DMX address. As an example, if you have a controller with a Unit id of 03, then when converted to run under DMX, the channel ranges will be 33 to 48.

LOR Unit ID	DMX Address	LOR Unit ID	DMX Address
01	1	11	257
02	17	12	273
03	33	13	289
04	49	14	305
05	65	15	321
06	81	16	337
07	97	17	353
08	113	18	369
09	129	19	385
0A	145	1A	401
0B	161	1B	417
0C	177	1C	433
0D	193	1D	449
0E	209	1E	465
0F	225	1F	481
10	241	20	497

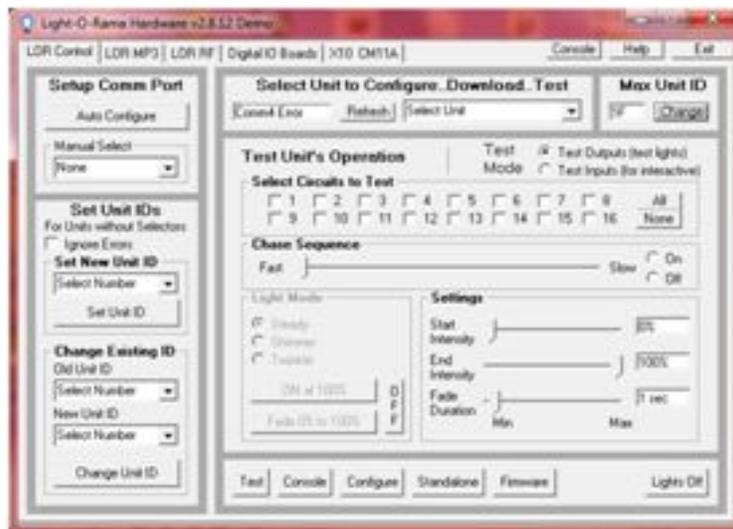


### Running LOR in DMX mode

The following diagram shows an example of how LOR controllers can be connected in DMX mode. Refer to the table above of Unit IDs to DMX channel conversions.

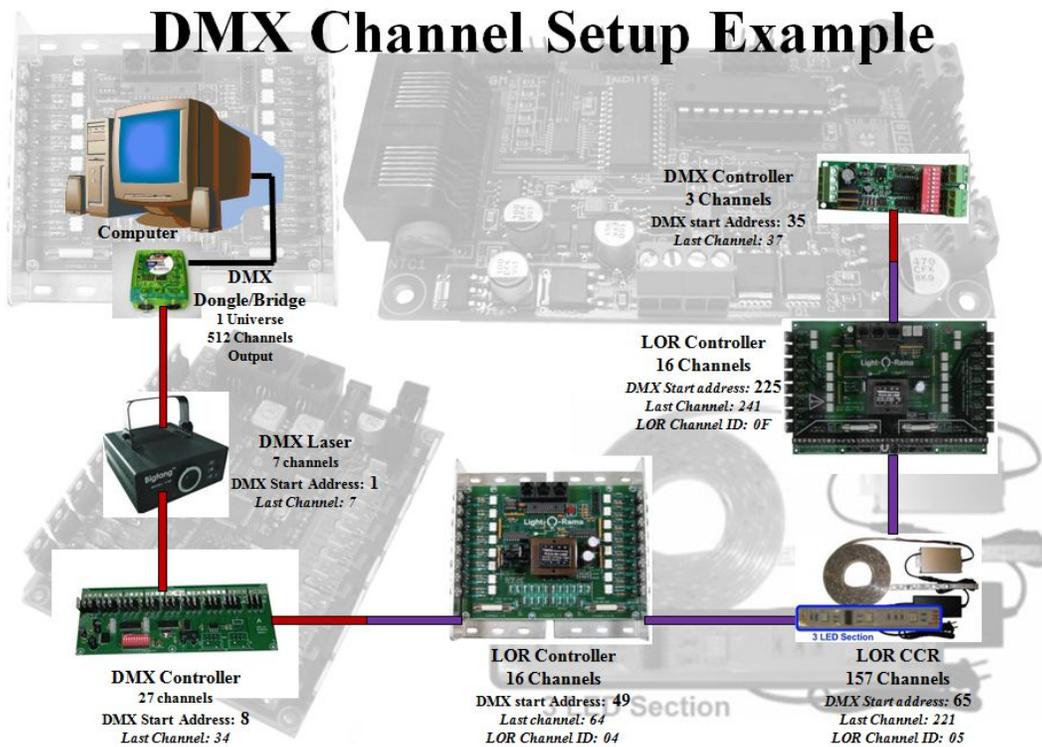


*Used with permission from FastEddy (ACL)*



*Used with permission from FastEddy (ACL)*

You must use the LOR hardware utility to set the DMX start address on a LOR controller if the controller doesn't have on board channel selection. The next diagram shows an example of how LOR controller addresses are set in a DMX universe. The controllers do not need to be physically connected in order of the controllers start address. The controllers can be put in any order.



*Used with permission from FastEddy (ACL)*

### Convert a LOR LMS file to play using non LOR hardware

*This section is based on a video created by Steve Giron*

The item to be converted is a purchased 12 leg CCR tree sequence. The input file should be in LMS format. Within xLights, go to the Convert tab and from there Select Convert, navigate to where the LMS file is and select it. Select the 'Show Verbose Channel Map' attribute. 'Click on Start Conversion.

If you get an error "Unable to determine the length of this LOR sequence (looked for length of track 1)", it usually means that the LMS sequence has been saved using the demo software. The lms file from demo LOR is mostly binary and does not contain the xml tags.

Error messages are expected for the first run in the status window on the right side. Scroll to top of error messages and look at messages that says "LOR Network".

The messages tell us that two networks are required: One with zero channels – (this was a star where channels were deleted from), one with 1800 channels.

```
Reading: C:\zzz-LOR\TSO DREAMS OF FIREFLIES 12 CCR-no-star2.lms
Reading LOR sequence
Channels found so far: 1000
Track 1 length = 14993 centiseconds
LOR Network 0: 0 channels
LOR Network 1: 1800 channels
Total channels = 1800
WARNING: channel 'CCR04-P21-Red' is unmapped
WARNING: channel 'CCR04-P21-Green' is unmapped
WARNING: channel 'CCR04-P21-Blue' is unmapped
WARNING: channel 'CCR04-P22-Red' is unmapped
WARNING: channel 'CCR04-P22-Green' is unmapped
WARNING: channel 'CCR04-P22-Blue' is unmapped
WARNING: channel 'CCR04-P23-Red' is unmapped
```



Go to the Setup tab and define these.

### Setup tab

(Existing layout)

Network Type	Port	Baud Rate or EL31 Univ	Num Chann...	xLights/Vixen/FPP Mapping
E131	10.10.1.206	1	510	Channels 1 to 510
E131	10.10.1.206	2	510	Channels 511 to 1020
E131	10.10.1.206	3	510	Channels 1021 to 1530
E131	10.10.1.206	4	510	Channels 1531 to 2040
E131	10.10.1.206	5	510	Channels 2041 to 2550
E131	10.10.1.206	6	510	Channels 2551 to 3060
E131	10.10.1.206	7	510	Channels 3061 to 3570
E131	10.10.1.206	8	30	Channels 3571 to 3600
E131	10.10.1.206	9	24	Channels 3601 to 3624

Add two entries: Network type of LOR, any baud rate, however the last channel must map correctly. Then move them to the top using the green UP arrows.

Network Type	Port	Baud Rate or EL31 Univ	Num Chann...	xLights/Vixen/FPP Mapping
LOR	COM3	19200	0	Channels 1 to 0
LOR	COM9	38400	1800	Channels 1 to 1800
E131	10.10.1.206	1	510	Channels 1801 to 2310
E131	10.10.1.206	2	510	Channels 2311 to 2820
E131	10.10.1.206	3	510	Channels 2821 to 3330
E131	10.10.1.206	4	510	Channels 3331 to 3840
E131	10.10.1.206	5	510	Channels 3841 to 4350
E131	10.10.1.206	6	510	Channels 4351 to 4860
E131	10.10.1.206	7	510	Channels 4861 to 5370
E131	10.10.1.206	8	30	Channels 5371 to 5400
E131	10.10.1.206	9	24	Channels 5401 to 5424

Ensure that 'Map Empty LMS Channels' is not selected (else you may get errors as the CCR macros do not have effects in them). Reconvert and it should convert with no errors.

Open the xseq file that was created and play it to view the effects on the layout window. You may need to click on the 'Render All' button.

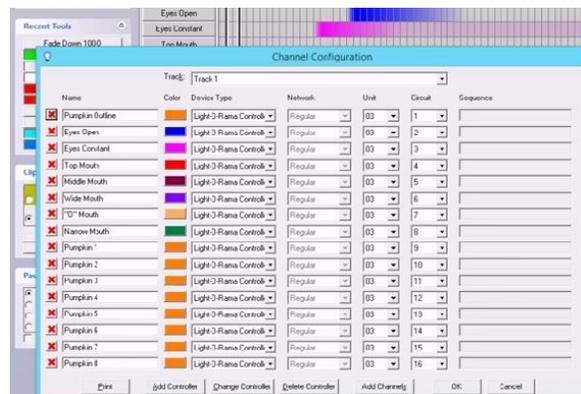
If you are not playing the sequence though LOR hardware, go back to the setup and delete the two LOR entries that you added for the conversion, leaving your previous configuration as it was. If you are using LOR hardware, then these entries will need to be correctly defined.

### Converting a LOR sequence and importing into xLights

*This section is based on a video created by Clyde Lindsey*

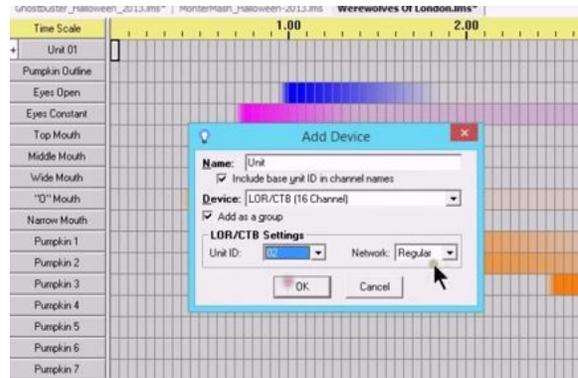
First ensure that within LOR, all the channels for the controller have been defined and are in sequence. Tools, Channel configuration will display an image similar to the following.

If there are any channels missing use the 'Add Channels' function to add the missing (unused) channel.

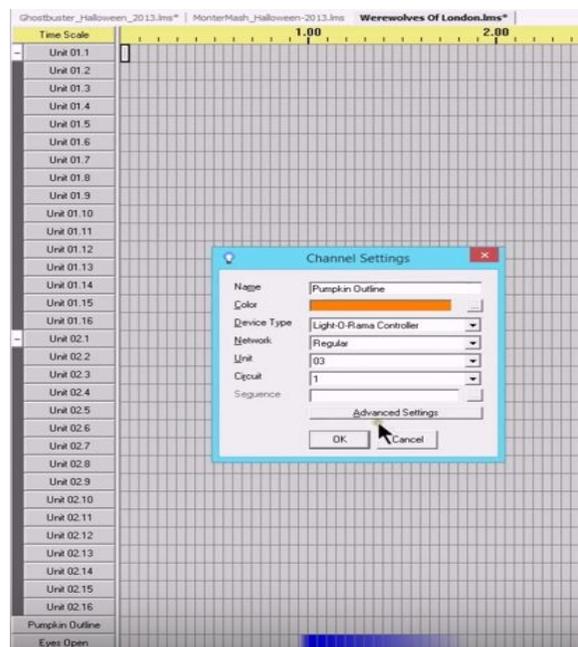




Note that in the image, the Unit id is 03 and the Channels (Circuit) values run from 1 to 16. However, referring to the LOR Unit Id to DMX channel *mapping* table Unit id 03 corresponds to Channel number 33. If Units prior to Unit 3 have not been defined, then you need to define them so as to 'utilise' the missing channels. Use the 'Insert Device' function to 'Insert Device Above' the current device (Unit 03) as a LOR 16 channel device – Unit id 01. Repeat this step and add another device - Unit id 02.



Therefore Channels 1-32 (Unit 1 and 2) have been defined – even if not required in LOR, and channels 33 – 48 belonging to Unit 03 are the ones that we are interested in.

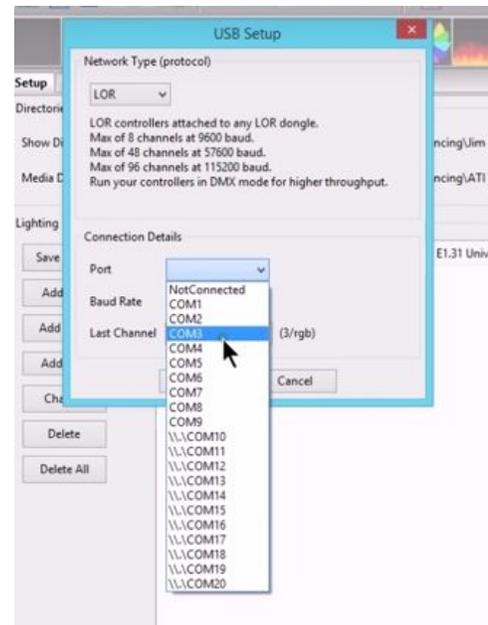


On the xLights setup screen, the corresponding channels must be defined.

You can define it as a USB, with a network type of LOR, and set up the COM port (obtained from the LOR device manager) and you will need to try different baud rates.

However, there is sometimes a lag associated with the sequence when you use this option.

It is preferable to use a DMX (to E131) bridge if possible and then define the channels as E131.





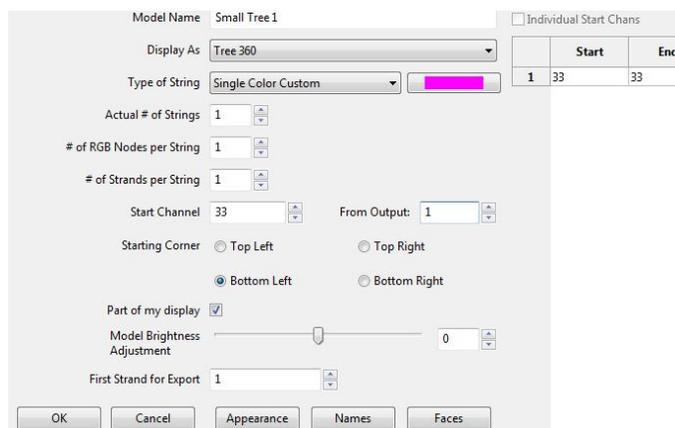
For the three devices were defined in LOR, only 48 channels need to be defined, but to preserve a buffer for future use, an extra 16 channels corresponding to an additional LOR device, (i.e. a total of 64 channels) will be defined in Universe 1 as E1.31.

### Model definition

Next create a new Model definition that matches the LOR Channels of Unit 03.

Let's say that this was 16 single channels Trees. In that case create a model 'Small Tree 1', with 1 channel. The start channel must be set to 33 (not 1) as this corresponds to the 1<sup>st</sup> channel of Unit 3.

Then you can copy the model, update the name (Small Tree 2) and change the starting channel to 34 and repeat this for all 16 channels, increasing the start channel by 1 each time until the last one is 48.



 **Tip:** If within the LOR Unit 03 definition, there are unused channels, you do not have to create a model for that channel or channel range. For example, let's say within Unit 03, channels 10-14 are not used. In which case, you would create 9 Trees (1 -9), and then another 2 trees (for 15-16). This is different to the setup tab where you must cover the entire range of channels from 1 onwards.

The next step is to use the Layout tab to align the models (the Trees) as required. Save the model definition.

### Import sequence data

Create a new music sequence, add timing tracks and add the models you have defined to the sequencer tab.

Using the Import, Import Effects menu, change the 'Import file' file to LOR Music Sequence - LMS, navigate to where the LOR LMS file is and select the file to Import.

On the Channel mapping screen, add all the xLights models – these will appear on the left hand side.

Do not select the Map by Strand/CCR option in this case.



Double Click in the Channel column – in line with the model name. You will be presented with a list of LOR models (as identified by the labels in LOR). Select the channel and repeat for all the models.

Save the mapping first, so that you can re-use it later.

Click Ok to start the process. After you which, click on the Render All icon and play the sequence.



**Tip:** If you were importing data from a Singing face where your model has multiple channels, then you need to double click in the Channel column, but against the node row instead.



**Tip:** The Convert tab has an option to ‘convert a LOR sequence file with a ‘Show verbose Channel map’ setting that will provide details of the LOR to xLights channel mappings . You can simulate a conversion and review the mapping details first.

Instead of using the Import tab to import the data as an editable effect, you can also import the data as a Data Layer. The process is much more efficient, however you cannot directly edit the data after your have imported it. That option has also been described in this chapter.

### Common Scenarios

#### *Scenario 1*

A user is still using LOR for 8 controllers this year. How should he set them up ? Should he run it in DMX if the controller support DMX?

The general rule is that you can do 96 channels of LOR with xLights if the LOR controllers are in LOR mode. In this case, put the LOR controllers in DMX mode and then xLights can do it all. The user can can import all the LOR sequences, schedule them play them, edit them, etc.

#### *Scenario 2*

A user has an E682 and an E6804 running pixels and 2 CMB16 and 1 CMB24 controllers. How should they be configured and connected ? Is a cross over cable required?

Plug in the USB, same com port that would be used, if running it from LOR. No crossover cable is required if running from a LOR network. On the setup screen, add LOR channels via USB device. Put in at least 48 channels. Set the com port as required. After the LOR USB row, add in universes of 510 for the E68x controllers.

#### *Scenario 3*

A user is using comm4 and the USB to ethernet dongle. How should they be configured?  
 Network Type – LOR, Port – COM4, Baud rate – 57600, Num channels (160 as example).  
 Note: Baud Rate of 250000 is for DMX only.



#### Scenario 4

A user is setup is a mixture of LOR and DMX Channels i.e. intermixed LOR -DMX-LOR-DMX.  
LOR Controller 1, LOR Controller 2, LOR Controller 3, DMX Universe 1 ch. 1-126,  
LOR Controller 4, LOR Controller 5, DMX Universe 1 ch. 127-183.

How should this be configured?

#### Option 1

Use Universe 1 for all the LOR and DMX channels.

Since the DMX is already set (channels 1-183), add an LOR entry with Universe 1 starting at 184 until the last channel for controller #5 ( $16 \times 5 = 90$ ), for a total of 274 total channels. You can 'reserve' additional channels should you need them later upto 510/512.

#### Option 2

Keep it simple with DMX - Universe 1, LOR - Universe 2 and then start with Universe 3 with the RGB controllers.



**Tip:** All the channels in LOR must be mapped exactly including blank ones in between. Setup your AC LOR channels first in XL4 and then start with your first prop in the same order as your LOR sequences. Otherwise the convert process will indicate that channels are unmapped.



**Tip:** LMS to xLights XML via Import Effects is done via model mapping so channel numbers don't matter. However, if using the LMS to xLights via Data Layer import option, channel numbers need to match models between LMS and xLights configurations.



**Tip:** When importing timing grids, xLights searches the LMS file for a section called <timingGrids> which needs to contain a subsection called <timingGrid> which must contain an attribute called "type=freeform". So, in case you can't import a LOR timing grid, you can open your LMS file in any editor that can view XML in a nice format like, Notepad++, and search for some of those terms to see why your timing grids aren't found inside the file.

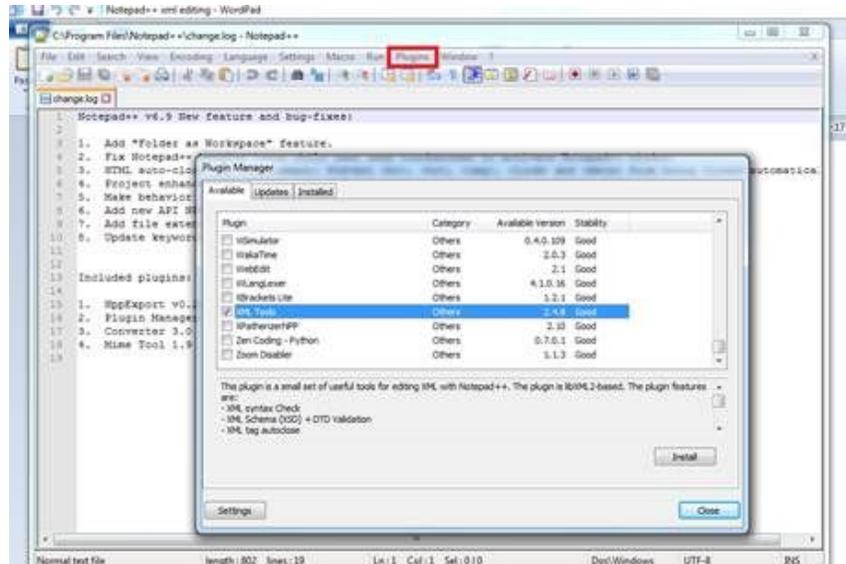


## Editing the xlights\_rgb.xml File

Most of the configuration data is stored in an xml file 'xLights\_rgbeffects.xml' in your show directory. Occasionally, a corruption of a component of the file may occur and you will be asked to edit this file. This section describes the contents of this file and how to safely edit it. Before you edit the file, backup the file (F10 from when in xLights will back up this and other xml files from your show directory).

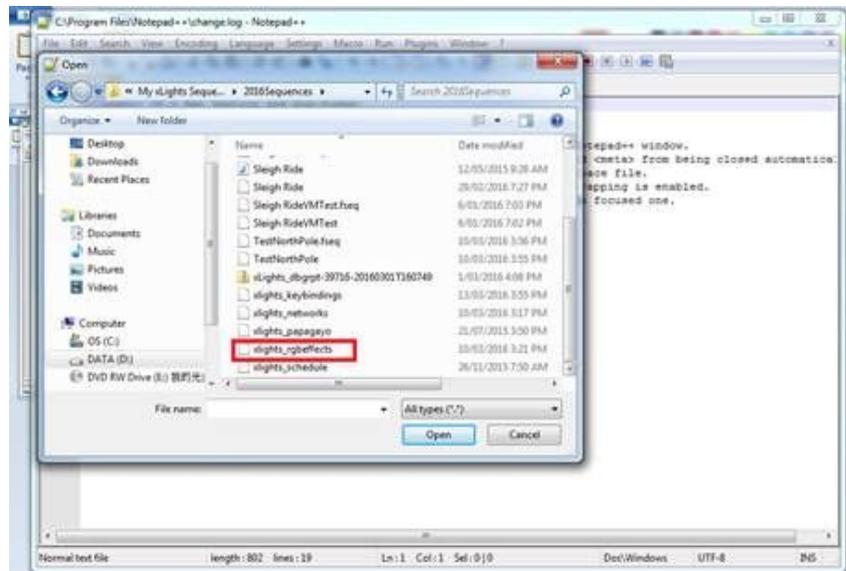
### Using Notepad++

One of the most useful free utilities is Notepad++. Download and install the latest version of Notepad ++ if you do not already have it installed. The following description has been based on Notepad++ version 6.9 running on Windows. Depending on your version, the screen and options may be slightly different. Once installed, install/activate the XML Tools Plugin.



### The rgb.xml effects file

Navigate to your show directory (or where you have the file that is to be edited) and open the 'xlights\_rgbeffects.xml' file.





When open and compressed, the xml structure is similar to the following:

The xml file contains the definitions of your Models, Effects, Palettes, Views, Model Groups, Perspectives, Settings etc. Click on the '+' sign to expand that section. In the following image, the View section has been expanded.

In the following image, the Settings section has been expanded.

In the following image, the Models section has been expanded.

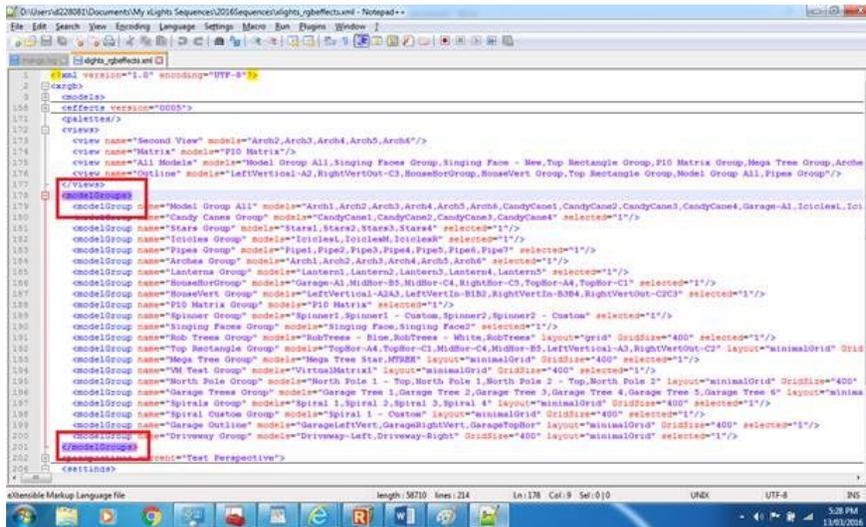


In the following image, the Models Groups section has been expanded.

```

1 <?xml version="1.0" encoding="UTF-8"?>
2 <!--
3 <model>
158 <effects version="0005">
171 <palette/>
172 </palette>
173 <view name="Second View" model="Arch2,Arch3,Arch4,Arch5,Arch6"/>
174 <view name="Matrix" model="PI0 Matrix"/>
175 <view name="All Models" model="Model Group All,Singing Faces Group,Singing Face - New,Top Rectangle Group,PI0 Matrix Group,Mega
176 <view name="Outline" model="LeftVertical-A2,RightVertOut-C3,HouseBorGroup,HouseVert Group,Top Rectangle Group,Model Group All,
</view>
177 </view>
178 </model>
179 <!--
180 <modelGroup name="Model Group All" model="Arch1,Arch2,Arch3,Arch4,Arch5,Arch6,CandyCane1,CandyCane2,CandyCane3,CandyCane4,Gara
181 <modelGroup name="Candy Cane Group" model="CandyCane1,CandyCane2,CandyCane3,CandyCane4" selected="1"/>
182 <modelGroup name="Stars Group" model="Star1,Star2,Star3,Star4" selected="1"/>
183 <modelGroup name="Icicles Group" model="Icicle1,IcicleM,IcicleR" selected="1"/>
184 <modelGroup name="Pipes Group" model="Pipe1,Pipe2,Pipe3,Pipe4,Pipe5,Pipe6,Pipe7" selected="1"/>
185 <modelGroup name="Arches Group" model="Arch1,Arch2,Arch3,Arch4,Arch5,Arch6" selected="1"/>
186 <modelGroup name="Lanterns Group" model="Lantern1,Lantern2,Lantern3,Lantern4,Lantern5" selected="1"/>
187 <modelGroup name="HouseBorGroup" model="Garage-A1,MidBor-B5,MidBor-C4,RightBor-C5,TopBor-A4,TopBor-C1" selected="1"/>
188 <modelGroup name="HouseVert Group" model="LeftVertical-AD3,LeftVertIn-B1B2,RightVertIn-B3B4,RightVertOut-C2C3" selected="1"/>
189 <modelGroup name="PI0 Matrix Group" model="PI0 Matrix" selected="1"/>
190 <modelGroup name="Spinner Group" model="Spinner1,Spinner1 - Custom,Spinner2,Spinner2 - Custom" selected="1"/>
191 <modelGroup name="Singing Faces Group" model="Singing Face,Singing Face2" selected="1"/>
192 <modelGroup name="Hub Trees Group" model="HubTrees - Blue,HubTrees - White,HubTrees - White,HubTrees layout="grid" GridSize="400" selected="1"/>
193 <modelGroup name="Top Rectangle Group" model="TopBor-A4,TopBor-C1,MidBor-C4,MidBor-B5,LeftVertical-A3,RightVertOut-C2" layout="
194 <modelGroup name="Mega Tree Group" model="Mega Tree Star,MFRB2" layout="minimalGrid" GridSize="400" selected="1"/>
195 <modelGroup name="VM Test Group" model="VirtualMaterial" layout="minimalGrid" GridSize="400" selected="1"/>
196 <modelGroup name="North Pole Group" model="North Pole 1 - Top,North Pole 1,North Pole 2 - Top,North Pole 2" layout="minimalGrid
197 <modelGroup name="Garage Trees Group" model="Garage Tree 1,Garage Tree 2,Garage Tree 3,Garage Tree 4,Garage Tree 5,Garage Tree

```



Each xml section is made up of a pair of matching tags. When you highlight a tag, notepad will highlight the end tag pair. This could be on the same line or after a few lines.

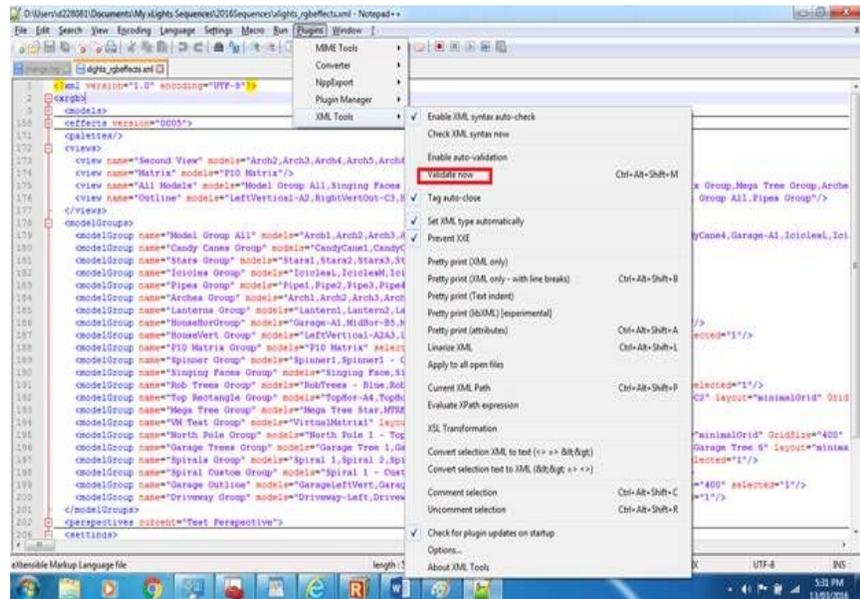
Ctrl Alt Shift B and Ctrl Alt Shift A will indent and expand the individual attributes.



**Note:** If you have been requested to delete a section, highlight the beginning and end tags and press delete.

When complete, click on the 'Validate now' to ensure that the xml is complete and well formed.

Click on Save to save the file and press ok.





## Online Support Groups

xLights has an excellent online support community. The main dedicated forum is the xLights forum located at <http://nutcracker123.com/forum>

Another support group called Official xLights Support Group can be found on Facebook.

<https://www.facebook.com/groups/628061113896314/>

Other online artefacts include:

The xLights Wiki

[http://www.nutcracker123.com/wk/index.php?title=Main\\_Page](http://www.nutcracker123.com/wk/index.php?title=Main_Page)

xLights Tutorials

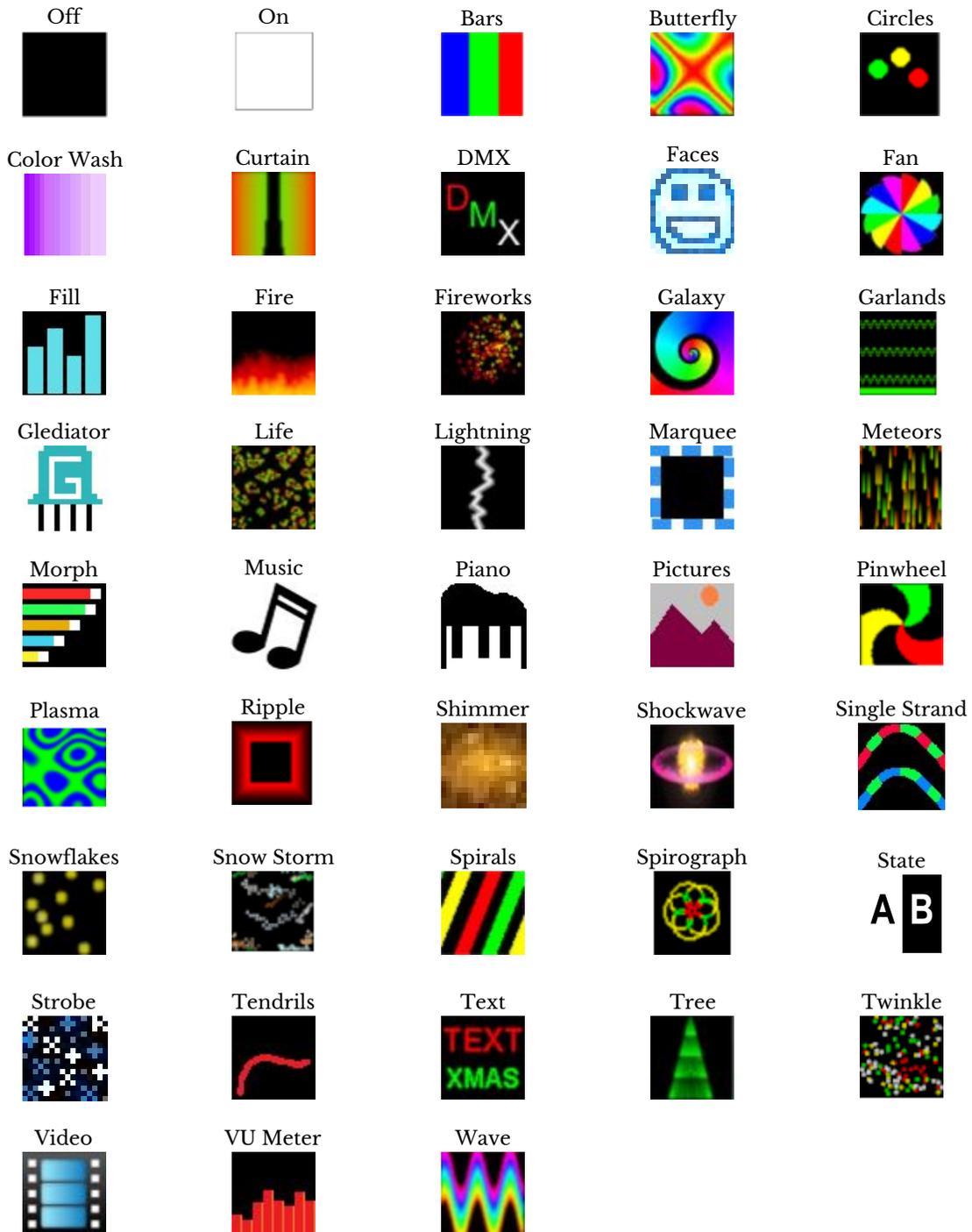
<http://www.nutcracker123.com/wk/index.php?title=Tutorials>

xLights FAQs

<http://www.nutcracker123.com/wk/index.php?title=FAQs>

# xLights

## Effects





# Off



## Description

The Off effect simply turns every pixel off on the model it is placed on.

This effect can be used in between other effects, to create a situation of a few seconds of “all lights off”, followed by effects coming on suddenly.

It can also be used on layers to adjust when an effect on another layer come on and goes off.

## Prerequisite information

Colors, Timing speed are ignored.

Option/Settings	Description
None	



**Tip:** You can use fade in/out with off.



**Tip:** In some cases, when a controller does not turn off lights at the end of a sequence, place an off effect against an ‘All model’ group to force the lights off.



# On



## Description

The On effect turns every pixel on for a given model.

## Prerequisite information

Only one color may be used with the ON effect.

If multiple colors are chosen, only the first color selected will be used.

Option/Settings	Description
Start intensity	Starting intensity value
End Intensity	Ending intensity value
Cycle Count	Number of cycles that the effects executes during the duration
Shimmer	A shimmer effects is added to the On effect.



**Tip:** A start intensity of 0% and ending of 100% will result in a ramp up, opposed to an ON with hard edges.



**Tip:** Click on the "Shimmer" to get a shimmer effect.



# Bars



## Description

The Bars effect creates straight edged multiple color bars that move across a model. The edges may be hard, highlighted or 3D (soft).

## Prerequisite information

None

Option/Settings	Description
Palette Rep	<p>Number of times the color palette repeats on a model. All the colors selected will repeat as many times as this value is defined.</p> <p>Therefore , if 2 colors are selected and this value is 3, each of the 2 colors will come on 3 times , resulting in 6 changes of colors.</p> <p>This whole setting is multiplied by the Cycles value.</p> <p>Can be adjusted via the Value Curves options.</p>
Cycles	<p>Number of cycles for the duration.</p> <p>Therefore</p> <ul style="list-style-type: none"> <li>● If set to 1, then the colors selected and palette rep combination will execute once.</li> <li>● If set to 2 and there are 3 colors and the palette rep is set to 4 , then there will be 24 changes of color (2 cycles * (3 colors * 4 reps) ) in the selected duration .</li> </ul> <p>Can be adjusted via the Value Curves options.</p>
Center Point	Enables you to control where the centre point is for expand and compress (both vertical and horizontal).
Direction UP/DOWN	Bars move UP or DOWN a model.
Direction Expand	Bars start at the center and move outward towards the top and bottom.
Direction Compress	Bars start at the top and bottom edges of a model and move to the center.
Direction Left/Right	Bars start at the left/right edges of the model and move to the other side.
Direction H-Expand	Bars start at the horizontal middle of the model and expand towards the left and right edges.
Direction H-Compress	Bars start at the left/right edges of the model and move in towards the horizontal center of the model.



<b>Direction Alternate</b>	Bars are not animated like the other direction options. The colors for each bar change to the next color selected in the palette.
<b>Highlight</b>	A single row of white is set at the leading edge of each color.
<b>3D</b>	The trailing edge of each color fades to black.
<b>Gradient</b>	When selected, causes the different colors to merge into each other as a gradient rather than as a sharp change.



**Tip:** Layering a On effect with a start intensity of 0% and ending of 100% will result in a ramp up, as opposed to an On effect with hard edges. Be sure to set the blending option of the On effect to “layer 1 is mask”. Make sure the cycle count is set to 1, and you have a color selected (doesn't matter which color since it's a mask).



# Butterfly



## Description

The Butterfly effect creates seemingly random patterns of color swirling around, based on an initial set of parameters.

This is very effective on a number of different types of models.

## Prerequisite information

None

Option/Settings	Description
Colors	Rainbow or Palette can be selected. If Palette is selected, then the colors from the Color selection window are used.
Style	Up to 5 different styles can be selected for the effect.
Bkgrd Chunks	Controls whether and how sections of black color are to be used between the colors. Can be adjusted via the Value Curves options
Bkgrd Skip	Used in conjunction with the background chunks to skip the black background. Can be adjusted via the Value Curves options.
Speed	Controls the speed with which the effects change. Can be adjusted via the Value Curves options
Direction	Controls whether the effect moves outwards or reverses direction.



**Tip:** Butterfly style #2 generates radial patterns that look great on round models such as snowflakes, stars, globes, etc.



**Tip:** The effect can be repeated on the same model with different colors, directions or timings, using layers and offsetting the position on the model.

In the context of [fast Fourier transform](#) algorithms, a butterfly is a portion of the computation that combines the results of smaller [discrete Fourier transforms](#) (DFTs) into a larger DFT, or vice versa (breaking a larger DFT up into sub-transforms). The name "butterfly" comes from the shape of the data-flow diagram in the radix-2 case. The earliest occurrence in print of the term is thought to be in a 1969 [MIT](#) technical report. The same structure can also be found in the [Viterbi algorithm](#), used for finding the most likely sequence of hidden states.



# Circles



## Description

The Circles effect creates solid sphere like objects that move seemingly in random fashion on a model. Used most effectively on models such as a mega tree or a matrix.

## Prerequisite information

One or multiple colors can be used for the effect. If multiple colors are selected, than the spheres will be made up of the selected different colors.

Option/Settings	Description
Number of Circles	Number of circles that displays on a model. Can be adjusted via the Value Curves options.
Size	The size of each circle of the effect. Can be adjusted via the Value Curves options.
Speed	The speed at which the circles move on the effect. Can be adjusted via the Value Curves options.
Bounce	The effect creates a noticeable bounce up and down of the circles.
Radial	The circles stretch outwards and back radially.
Plasma	The circle edges blend into each other. Increase the number of circles for this value to be effective.
Radial 3D	The circles stretch outwards and back radially.
Bubbles	Each circle displays an outline rather than being solid in color.
Linear Fade	Causes each circle to blur and have its edges fade to black.



**Tip:** Place the effect to initially span at least a few seconds. After placing the effect on the model, adjust the number of circles and the speed down until the circles can be seen moving around and then adjust upwards as required.



**Tip:** Place the Circles effect on a star and select the Radial option to obtain a nice looking effect.



# Color Wash



*Grid Icon Background setting turned on showing colors selected within the color pallet window.*

## Description

The Color Wash effect creates a wash effect of the selected color or colors across the model. Can be effective if multiple colors are selected and the effect is used as a background effect.

## Prerequisite information

One or multiple colors can be used for the effect. If multiple colors are selected, then the ColorWash will use the selected colors repeating the colors depending on the 'count' setting.

Option/Settings	Description
Count	<p>Number of times the colors selected will be repeated for the duration of the effect.</p> <p>Each set of colors repeats as many times as the count value has been set to.</p> <p>Can be adjusted via the Value Curves options.</p>
Vertical Fade	Controls whether the wash effect should fade vertically.
Horizontal Fade	Controls whether the wash effect should fade horizontally.
Shimmer	Applies a shimmer effect to the Color Wash effect if selected.
Circular Palette	When selected, this smooths the color transitions when the effect repeats per the count setting. If not selected there will be a hard transition between the last color selected and the first color selected.



# Curtain



## Description

The Curtain effect creates a color transition of one or more colors across the face of a model depicting a curtain opening or closing based on the options selected.

Used most effectively on models such as a mega tree, a matrix, whole house or grouped arches. Can also be used on singular items such as each arch.

Option/Settings	Description
Curtain edge	<p>Denotes how the curtain edge will come together (i.e. close) or open – depending on the ‘Effect’ setting value.</p> <p>Examples:</p> <p>Center – Two curtains will move from the outside to the inside (center) of the model or from the inside (center) to the outside of the model.</p> <p>Bottom – The curtain sweep will be from the top, closing or opening out towards the bottom.</p>
Effect	<p>Denotes whether the curtain should open, close, open then close or close then open. Used in conjunction with the curtain edge direction.</p>
Swag Width	<p>Defines the curve of the curtain effect. A value of zero will depict a straight curtain edge. A value of 10 will depict a curved curtain edge with a sweeping drop.</p> <p>Can be adjusted via the Value Curves options.</p>
Swag Speed	<p>Defines the speed at which the curtains will close or open.</p> <p>Can be adjusted via the Value Curves options.</p>



**Tip:** You can use the curtain effect layered with any other effect as a mask to reveal the other effect.



# DMX



## Description

The DMX effect is used to output a value between 0-255 to the model.

Channel 1 in the DMX effect corresponds to the first channel of the model and up to 18 channels can be controlled.

Use a Single Line model for RGB nodes. As an example, 5 RGB nodes which will create 15 channels of data.

Option/Settings	Description
Channels 1-9 Tab	Select the tab to control Channels 1 -9
Channels 10-18 Tab	Select the tab to control Channels 10-18
DMX Value	Select the DMX value (from 0 to 255) for the Channel that has been selected. The channels will be offset from wherever is defined in the model definition. So if the model for a DMX device starts at channel 450 then the channel 3 slot will control channel 452.
	Click on the Value Curves icon to open a list of additional nonlinear effects. Use the Ramp effect to vary the output anywhere from 0 to 255.



**Tip:** For Pan/Tilt head control movement, select the Use Ramps attribute and set it to a timing mark of say 10 seconds long. It will move the head for 10 seconds between the ramp values.



# Faces



The Faces effect is used by xLights to generate singing and talking face effects. It is used and placed on the sequencer as part of the Papagayo import functionality, if the target in xLights is a Coro face.

It is also used within xLights functionality to generate Singing Faces. The use of this effect is described in the section describing Singing Faces.



# Fan



*Grid Icon Background setting turned on showing colors selected within the color pallet window.*

## Description

The Fan effect creates spiralling blade like objects that move around the model either clockwise or counterclockwise. Used most effectively on models such as a mega tree or a matrix.

## Prerequisite information

One or many colors can be used for the effect. If multiple colors are selected, then the blades of the fan will be made up of the selected colors.

Option/Settings	Description
<b>Position: Center X,Y</b>	Defines the x and y coordinates of the center (i.e. focus) point of the fan effect.
<b>Position: Radius 1</b>	Defines the lower radius of the fan.
<b>Position: Angle</b>	Defines the angle of each arm of the fan.
<b>Position: Radius 2</b>	Defines the upper radius of the fan.
<b>Position: Revs</b>	Defines the number of 360 degree rotations per timing mark the effect is in.
<b>Blades: # Blades</b>	Defines how many blades the fan effect will use per color selected.
<b>Blades: Width</b>	% of area that the width of each blade will take on the effect.
<b>Blades: Angle</b>	Angle of each blade from center.
<b>Blades: # Elements</b>	How many segments each blade is divided into - default is 1.
<b>Options:Duration</b>	Controls the swell i.e. the amount of time that the fan swells out.
<b>Options: Acceleration</b>	Controls how quickly the fan swells out and then back in.
<b>Options: Reverse</b>	Reverses the direction of the rotation of the fan effect.
<b>Options: Blend Edges</b>	Each edge blends to black. Turning it off converts the fan effect to a full circle at the end of each swell.



**Tip:** Playing with the radius values i.e. making radius 2 less than radius 1 can provide some interesting effects.



**Tip:** You can create four Fan effects that each take up about one quadrant of your model (matrix/house) and have them all doing different thing with their arms blending at the edges. The four positions would be x25:y25, x25:y75, x75:y75, x75:y25.



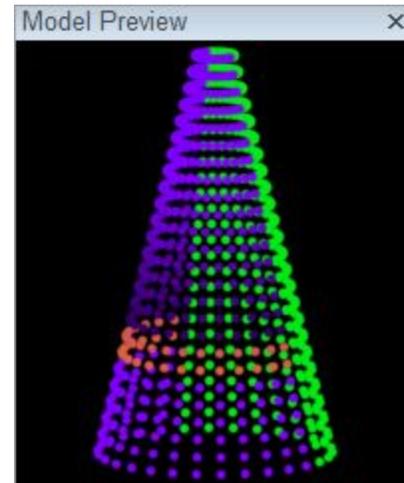
# Fill



## Description

The Fill effect starts from the left, right, bottom or top edge (position) and does a complete fill to the position value.

The position has a Value Curve so you can make it do precise dynamic positioning during the duration of the effect. Select multiple colors to fade (equally) between those colors for the duration of the effect.



## Prerequisite information

None

Option/Settings	Description
Position value	0 - 100%. Can be adjusted via the Value Curves options.
Band Size	Controls the proportion ( % wise) of the total length of the effect that the pixels will light up.
Skip Size	Controls the proportion (% wise) of the total length of the effect that will be skipped by the pixel color ie will be dark.
Offset	Adjusts as a %, the center point of the offset for the fill effect.
- Offset in Pixels	Used to specify exact number of pixels rather than % for offset.
- Change Color based on Time	
Direction	Determines the direction that the effect starts and ends.
- Up	Starts at bottom and moves up.
- Down	Starts at top and moves down.
- Left	Starts at right and moves left.
- Right	Starts at left and moves right.



# Fire



## Description

The Fire effect creates an effect that appears as licks of flames.  
Used most effectively on models such as a mega tree or a matrix.

## Prerequisite information

None

Option/Settings	Description
Height	Defines the 'length' or height of the flames. Can be adjusted via the Value Curves options.
Hue Shift	Defines the color of the flame. Can be adjusted via the Value Curves options.
Growth Cycles	Defines the total length that the flames should grow to. Can be adjusted via the Value Curves options.
Grow with music	When enabled adjusts the height according to the music intensity
Location	Defines the initial location and therefore the direction of the flames. eg a setting of 'Bottom' would drive the flames from the bottom to the top.



# Fireworks



## Description

The Fireworks effect creates a fireworks type of effect of exploding lights in a burst. Used most effectively on models such as a mega tree or a matrix.

## Prerequisite information

One or multiple colors can be used for the effect. If multiple colors are selected, then the lights in the explosion will be made up of the selected colors.

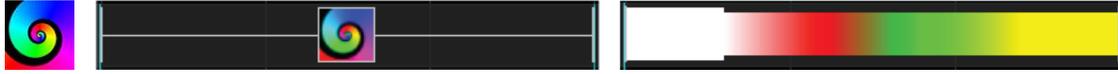
Option/Settings	Description
Number of Explosions	Defines the number of explosions to be created.
Particles in Explosion	Controls the number of particles in the explosion.
Velocity of Particles	Controls the speed of the particles exploding.
Particle Fade	Defines the speed at which the particles should fade in the explosion after the initial burst.
Fire with Music	Controls whether the audio signal should be used to control the effect. If not selected then a set number of fireworks are triggered instead.
Trigger level	Controls how high the music level needs to be before the effect will be triggered, if 'Fire with Music' is selected. Where the waveform is relatively flat, the fireworks may trigger repeatedly if the waveform does not drop below the trigger level.



**Tip:** Add multiple layers of fireworks with different colors on each layer to get more explosions with multiple colors at the same time. Set different velocities and number of explosions on each layer.



# Galaxy



*Grid Icon Background setting turned on showing colors selected within the color pallet window.*

## Description

The Galaxy effect creates a spiral like effect that expands around the model either clockwise or counterclockwise. Used most effectively on models such as a mega tree or a matrix.

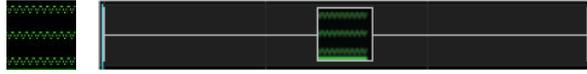
## Prerequisite information

One or multiple colors can be used for the effect. If multiple colors are selected, than the spiral will be made up of the selected colors.

Options/Settings	Description
Start: Center X,Y	Defines the x and y coordinates of the center (i.e. focus) point of the galaxy effect.
Start: Radius	Defines the lower radius of the galaxy.
Start: Width	Controls the width of the lower end of the spirals.
Start: Angle	Controls the angle of the spirals.
End: Radius	Defines the upper radius of the galaxy.
End: Width	Controls the upper width of the spirals.
End: Rev's	Determines the number of full revolutions each arm makes in the given timeframe.
Options: Head Duration	Controls the swell i.e. the amount of time that the head of the spiral uses.
Options: Acceleration	Sets the speed of a non-linear movement for the head color and body.
Options: Reverse	Reverses the direction of the rotation of the galaxy effect.
Options: Blend Edges	Each edge blends to black. Turning it off converts the galaxy effect to a full circle at the end of the rotation.
Options: Inward	If the spirals overlap, it determines if the spirals will appear to be moving inward or outward. If there is no overlap, this setting will have no effect.



# Garlands



## Description

The Garlands effect creates an effect that simulates a circle of rings that drop on each other (depending on the direction of the effect).

## Prerequisite information

One or multiple colors can be used for the effect. If multiple colors are selected, then the spheres will be made up of the selected different colors.

Option/Settings	Description
Garland Type	Controls 4 different type of garland effects.
Spacing	Controls the spacing of each cycle of the garland. Can be adjusted via the Value Curves options.
Cycles	Controls the number of complete cycles of the effect in the given timeframe. Can be adjusted via the Value Curves options.
Stack Direction	The direction in which the garland effects move or drop. Up to 8 variations are possible i.e. Downwards, Upwards etc.



# Glediator



## Description

The Glediator effect enables the import and use of an effect that has been created using the Glediator software into xLights

## Prerequisite information

Glediator is a 3rd party application that can generate an unlimited number of effects. Once an effect has been created, it must be saved as a .GLED file.

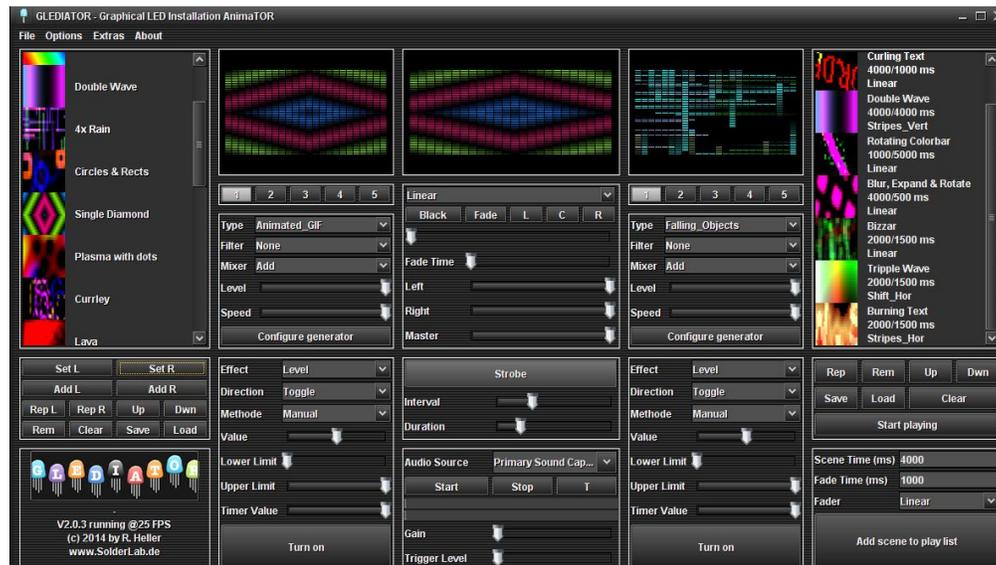
## Procedure

Place the Glediator effect in on timing cells that you wish to have the effect on a model.  
Click on the filename prompt and browse and select the glediator file.



**Tip:** You must configure Glediator to the X,Y dimensions of your model you wish to add effects to.

You may also use Jinx! to create effects. It will create a '.out' file which can be used with this effect. There is no need to rename the saved output file to .gled to use with the Glediator effect. The Glediator effect now supports .GLED and .OUT files.





# Life



## Description

The Life effect simulates the Game of Life cellular automation model.

*From Wikipedia:*

*“The universe of the Game of Life is an infinite two-dimensional orthogonal grid of square cells, each of which is in one of two possible states, alive or dead. Every cell interacts with its eight neighbours, which are the cells that are horizontally, vertically, or diagonally adjacent.”*

## Prerequisite information

One or multiple colors can be used for the effect.

Option/Settings	Description
Cells to Start	Controls the number of cells that the effects starts with.
Type	Selects the type of pattern. Four values can be selected.
Speed	Controls the speed at which the pattern and cells live and die.



# Lightning



## Description

The Lightning effect generates a vertical lightning bolt type of effect.

## Prerequisite information

One or multiple colors can be used for the effect. White is always selected for the outer edge of the lightning bolt.

Option/Settings	Description
Number of Segments	Defines the number of zigzag segments to be used in the effect. Can be adjusted via the Value Curves options.
Width of Bolt	Controls the width of the zig zag. A value of 1 will form a straight vertical line. Can be adjusted via the Value Curves options.
Forked Lightning (Y,N)	Controls whether the effect generates a forked effect.
Top Location (x;y)	Defines the coordinates of the top end of the lightning bolt. Can be adjusted via the Value Curves options.
X Movement	Controls the movement of the lightning effect horizontally across the effect. Can be made to be stationary or move in either direction. Can be adjusted via the Value Curves options.



# Marquee



## Description

The Marquee effect displays scrolling lines or bands of pixels around the edge of an model or from one end of a line to the other.

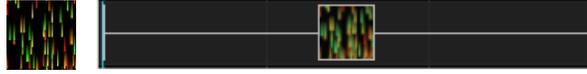
## Prerequisite information

One or multiple colors can be used for the effect. If multiple colors are selected, then the bands of the effect will be sequentially selected from the colors chosen.

Option/Settings	Description
Band Size	Controls the proportion ( % wise) of the circumference of the marquee effect that the pixels will light up.
Skip Size	Controls the proportion (% wise) of the circumference of the marquee that will be skipped by the pixel color ie will be dark.
Thickness	Controls the thickness of the marquee effect ie how many pixels wide.
Stagger	Defines the orientation of the pixel band thickness (visible if the thickness is > 1).
Speed	Controls the speed at which the marquee effect moves around.
Reverse	If selected, reverses the direction of the effect to counterclockwise.
Scale (x:y)	Used to control the scale (i.e. boundary) of the marquee effect. Defined as a % from -100% to + 100% if 'Offset in Pixels is not ticked Defined as number of Pixels from -100 to + 100 if 'Offset in Pixels is ticked
Offset in Pixels	Used to specify exact number of pixels rather than % for offset - see Scale (x:y)
X-axis, Y-axis Center	Used to control the center position of the marquee effect within the model
Wrap X	Used to warp the effect horizontally around the model.



# Meteors



## Description

The Meteors effect generates a number of meteor like streaks of color.

## Prerequisite information

None.

Option/Settings	Description
Colors	Defines whether the Rainbow collection of colors is to be used for the effect or whether colors are to be selected from the Palette. If Palette is selected, then the colors used will be the ones selected via the Color window for the effect.
Effect	Selects the direction of the meteors. Eight options are possible including Down, Up, Left, Right, Implode, Explode, Icicles and Icicles_bkg.
Count	Controls the number of particles used for the effect.
Trail Length	Controls the length of the tail of the meteor.
Swirl intensity	Controls whether the meteor moves smoothly or swirls/oscillates.
Speed	Controls the speed of the meteor effect.
Horizontal offset	This attribute (applicable for the Implode and Explode effect options) adjusts the center of the effect horizontally.
Vertical offset	This attribute (applicable for the Implode and Explode effect options) adjusts the center of the effect vertically.
Adjust count based on musical intensity	If selected, will increase the number of meteors when the song intensity is high and will decrease it for quieter sections of the song.
Starfield Simulation	Enabled if the effect value is Implode or Explode - Simulates a starfield burst.



# Morph



*Grid Icon Background setting turned on showing colors selected within the color pallet window.*

## Description

The Morph effect creates a movement across a model of one or many strands of lights with a head, body and tail. Morph looks best on mega trees, arches and matrix models.

## Prerequisite information

The first 2 colors chosen will be the head color, middle 2 colors chosen will be the body colors and the last 2 colors chosen will be the tail colors.

A morph can start anywhere and end anywhere on a model. The starting and ending locations are specified by the X,Y coordinates on the Start/End tabs.

Option/Settings	Description
Start : X1a	Defines the first lateral position starting point (0 is bottom).
Start : Y1a	Defines the first vertical position starting point (0 is left).
Start : X1b	Defines the second lateral position starting point.
Start : Y1b	Defines the second vertical position starting point (100 is right).
Start : Head Length	Defines how long the head will be and is depicted by the head effect on the grid.
Start : Link Points	Enabling this option will cause the X,Y B points to be linked to the X,Y A points.
Morph Quickset Options	These options allow the user to quickly choose a commonly used morph type and direction. These are customizable after they are selected.
End : X2a	Ending position 1 on the horizontal axis (100 is top).
End : Y2a	Ending position 1 on the vertical axis.
End : X2a	Ending position 2 on the horizontal axis.
End : Y2b	Ending position 3 on the vertical axis.
End : Head Length	Defines the relative size of the head when the morph reaches the end points.
End : Link Points	Enabling this option will cause the X,Y b points to be linked to the X,Y a points.
Head Duration	Defines how long the head will show during the morph before it changes to the body colors.
Acceleration	Defines a non-linear speed for the movement of the morph.
Repeat Count	This is used when selecting a single morph and you want it to repeat x number of times.



Repeat Skip	Sets the number of legs on the model that the morph will skip when the repeat option is enabled.
Stagger	This is used in conjunction with the single line morph and repeat. It can be set to positive or negative values for left or right sweeping type morphs. Small values look best (1-4).
Show Head at Start	When used with the stagger option, the head of each morph will show prior to the morph moving based on the stagger interval.



**Tip:** Open and use the Effect Assist window. The window will display a grid corresponding to the x,y start and end coordinates. If you then grab a slider for the morph effect and move it, the Effect Assist window shows exactly where the coordinate is being moved to, making it easier to determine what is being done to the effect.



# Music



## Description

The Music effect analyses and displays a representation of the frequency breakdown of the song from the waveform.

## Prerequisite information

Select at least two colors.

Option/Settings	Description
Bars	Controls the number of bars that are displayed for the effect. The bars displayed is also influenced by the range of notes selected.
Type	Separate - Color bars starts in the middle and separates out. Morph - starts at the bottom and goes to the top. (Use layer settings to change/rotate direction). Bounce - Similar to Morph , but bounces after each completion. Collide - Color bars starts at the outside and move inwards. On - The bar comes on and fades away.
Start , End Note	Controls (narrows) the range of notes (MIDI values) that are used for the effect i.e notes outside this range will be filtered out. Value 60 corresponds to 'Middle C' .
Sensitivity	Controls the threshold level of the music at which the effect gets triggered. The effect will last as long as the intensity is above the threshold. Increasing the sensitivity raises the threshold and therefore reduces the effects.
Offset	Enables the effect to be moved horizontally to the left or right. Useful if you wish to layer another effect offset in the other direction. Can be adjusted via the Value Curves options.
Scale Bars	If selected, will cause the bars to be spread out (i.e scaled across the whole effect spectrum).
Note Scaling	If selected , will increase activity of All/Individual notes in quiet areas of the song. Using scaling makes effects trigger easier.  Options: <ul style="list-style-type: none"> <li>● None: Notes aren't scaled.</li> <li>● Individual notes: Each notes is scaled such that every note will reach 100% at some time during the duration of the effect.</li> <li>● All notes: Notes are scaled such that one note will reach 100% at some time during the duration of the effect.</li> </ul>
Color	Changes the way that the colors are rendered . Options are Distinct , Blend or Cycle. For the Cycle option, the first time the note is triggered , the first color of the palette will be selected, the next time the second color etc as the colors are cycled through.
Fade	Controls whether the effect fades over it duration.





# Piano



## Description

The Piano effect displays a piano keyboard effects where the keys modulate based on the beat and frequency of the sequence audio.

## Prerequisite information

In addition to generating the effect using xLights inbuilt capability to process sound waves , you can also use an externally created Polyphonic Transcription notes file or an external midi file.

Option/Settings	Description
Notes Source	<p>Indicates what the source for generating the Piano effects is.</p> <p>Options are: Audacity Timing file, Midi file, xLights generated Polyphonic Transmission or Notes Source.</p> <p>If Polyphonic transmission is selected, then a window will be displayed and there will be a pause whilst the timings are first generated.</p> <p>If 'Audacity Timing file' is selected, you will be prompted for the location of the Audacity file.</p> <p>If 'Midi file' is selected, you will be prompted for the location of the Midi file.</p> <p>If Notes Source is selected, then a timing track source can be used (further described after the table). This is the preferred option.</p>
Type	Indicates how the piano keys should be displayed - 'True Piano' or 'Bars'.
Start Midi Channel	The Start and End Midi channels defines the range that the Piano keys should emulate. The wider the range, the more keys are required. 64 corresponds to the 'Middle C' key on the Piano.
End Midi Channel	See Start Midi Channels.
Show Sharps and Flats	If selected , then the Sharp and Flat 'Black' keys of the piano are shown and played.
Vertical Scale	Used to adjust the height of the effect vertically i.e. lengthen or shrink the effect. Can be adjusted via the Value Curves options.
Horizontal Offset	Controls the position of the effect horizontally ie can be shifted left or right.
File	The name and location of the polyphonic transmission label file or Midi file if one of these have been selected as the source.
Track	If a Midi file is selected , a list of Tracks that the file contains is displayed. You can select one of them or All (in which case the tracks are merged).
Midi Start Time Adjust	If a Midi file has been selected , this attribute can be used to adjust the synchronisation of the midi file to the song being sequenced in case they are slightly off from each other.
Midi Speed Adjust	If a Midi file has been selected , this attribute can be used to adjust the tempo (increase or slow down). It is used to try to match tempos of the songs.



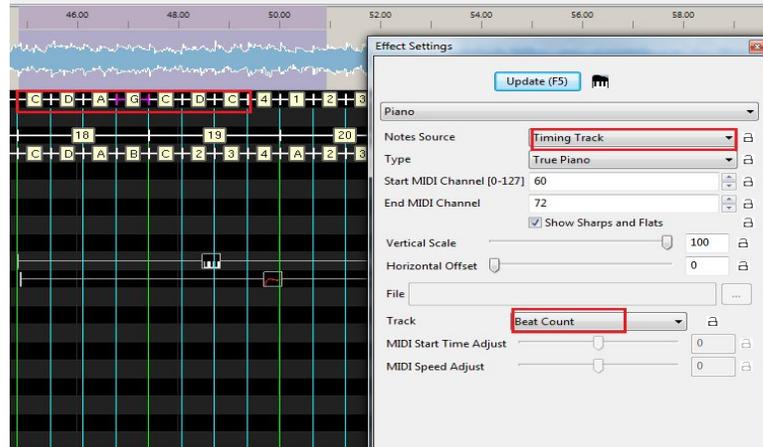
**Source = Timing Track**



Set the source to timing track and select the Track from the list of Timing tracks you have generated in the sequence.

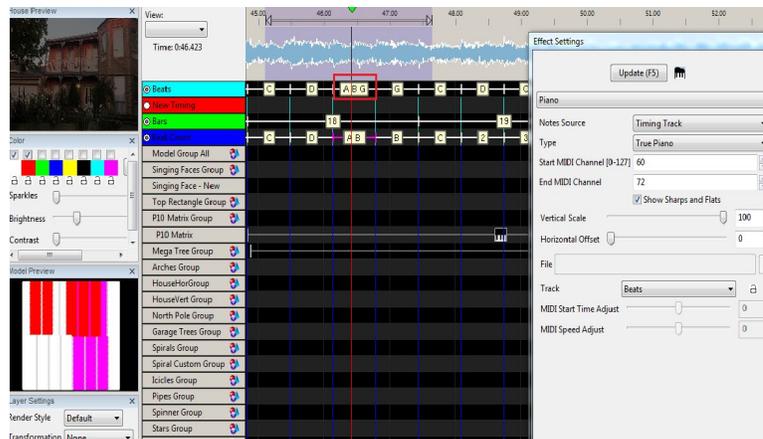
Then, expand the view so that you can see the labels of the timing track and change the labels to match the required keys.

The label can be the key letter or can be the MIDI value of the key.



You can also specify multiple values in one label and accordingly multiple keys will be depressed.

You can use a value of C# to depress the C# key, C to depress the C key or multiple values such as C F A to depress three keys.



Multiple key formats are supported:

- 1-127: midi codes
- C4 or c#4: note and octave
- C or C#: notes (assumed to be 4<sup>th</sup> octave)

Keys are separated by space, comma or colons.



# Pictures



## Description

The Pictures effect is used to import a supported image type (gif, bmp, jpg etc) and render that image as an effect while also allowing the image to be manipulated and edited within xLights.

## Prerequisite information

The image that is to be imported.

Save the image as a GIF file and make the background color transparent if you don't want the original (white) background of the image.

## Procedure

Place the Picture effect in on timing cells that you wish to have the effect on a model.

Click on the effect on the grid and amend the parameters as required. First click on the Browse button and navigate to the location of your image, select the image and click open or double click to select the image.

Option/Settings	Description
Movement	Controls how the image will move across the model layout. In addition to directional options such as left, right, wiggle etc, there are a number of special options, such as peekaboo, flag wave.
Movement Speed	Controls how fast the image moves across within the effect timeframe.
Frame Rate Adj	When using the pictures effect to play an AVI converted to images with ffmpeg, this setting is used to set the playback speed if needed to speed up or slow down the playback.
Offset in Pixels	Used to specify exact number of pixels rather than % for the start and end positions offset.
Scale to Fit	If the image is not scaled to your model (eg matrix), this setting will autoscale the image.
Start Position: (x,y)	Sets the position of the image if it does not need to be centered on the model.
Start Position: (wrap x)	Used to bound the picture image within the model. Defines and controls the coordinates of the 'bottom left' start corner.
End Position: (x,y)	Used to bound the picture image within the model. Defines and controls the coordinates of the 'top right' end corner.
Start Scale	Set the starting position scale (0 - 1000%) independently of the start position.
End Scale	Set the ending position scale (0 - 1000%) independently of the end position.



**Tip:** The playback rate is influenced by the length of the effect. So if you change the time length of your effect and have an image that is non stationary, the rate of movement will adjust according to the new time length.



**Caution:** If you move the image that you have used for the picture effect to a different location or



delete it, when you next run the sequencer, if the image is not found, an error message will not be displayed, but the picture effect will render a blank image. The only time this won't happen is if only the drive letter has changed, and the rest of the path is the same.



# Pinwheel



## Description

The Pinwheel effect generates a rotating pinwheel arrangement or radial rays type of effect.

## Prerequisite information

None

Option/Settings	Description
#Arms	Defines the number of radial arms to be used for the pinwheel.
Size	Defines the outer circumference of the effect. Can be adjusted via the Value Curves options.
Twist	Controls whether the arms should be straight or twist clockwise or counterclockwise (within the rotation). Can be adjusted via the Value Curves options.
Thick	Controls the color thickness of each arm. Can be adjusted via the Value Curves options.
Speed	Controls the speed of the rotation. Can be adjusted via the Value Curves options.
Rotation	Defines the direction of rotation i.e. Clockwise or counterclockwise.
3D	Defines whether the pinwheel should have a 3D or inverted 3D effect.
X-axis Center	Controls the position of the fulcrum of the pinwheel along the horizontal axis. Can be adjusted via the Value Curves options.
Y-axis Center	Controls the position of the fulcrum of the pinwheel along the vertical axis. Can be adjusted via the Value Curves options.



# Plasma



## Description

The Plasma effect generates cycles of changing color to give an illusion of a liquid organic movement effect.

## Prerequisite information

None

Option/Settings	Description
Color Choice	Normal or 4 other preset values. if Normal is selected, then one or more colors from the palette can be used to define the colors of the effect.
Add Twist to Effect	Defines how much the components of the movement i.e the ripple, twists.
Line Density	Controls the thickness of each line of the ripples within the effect.
Speed	Controls the rate of change of the ripple movement within the effect. Can be adjusted via the Value Curves options.



# Ripple



## Description

The Ripple effect generates a ripple like spreading movement of color similar to when an object is dropped into water.

## Prerequisite information

One or multiple colors can be used for the effect.

Option/Settings	Description
Object to Draw	Defines the shape of the object that will ripple. The Circle is the default and the most commonly selected value. A Square and Triangle shape can also be selected.
Movement	Defines the direction of the ripple i.e. Explode (Outwards) and Implode (Inwards).
Thickness	Controls the thickness of each line of the ripple. Can be adjusted via the Value Curves options.
Cycle Count	Defines the number of cycles that the shape should explode/implode within the given time frame of the effect. Can be adjusted via the Value Curves options.
3D	Indicates whether the ripple effect should render as is a 3D or 2D effect.



# Shimmer



## Description

The Shimmer effect provides an effect whereby the lights rapidly turn on and off.

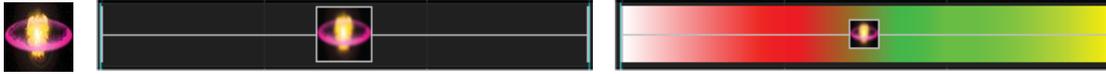
## Prerequisite information

One or multiple colors can be used for the effect.

Option/Settings	Description
Duty Factor	Defines what percentage of the total cycle the lights will shimmer on. For the rest of the time in the cycle, they will be off. Can be adjusted via the Value Curves options.
Cycle Count	Defines the number of cycles (shimmer on, followed by an off period) that will be repeated in the timeframe of the effect. Can be adjusted via the Value Curves options.
Use All colors	If ticked, then the shimmer effect generates a pulse effect rather than a shimmer effect with the selected colors pulsing off and on in sequence.



# Shockwave



*Grid Icon Background setting turned on showing colors selected within the color pallet window.*

## Description

The Shockwave effect describes a circular object that starts small and expands to a larger circle. The effect can be configured to do the opposite i.e. start as a large circle and shrink to a smaller one.

## Prerequisite information

One or multiple colors can be used for the effect. If multiple colors are used, then as the effect expands or contracts, the circle color will cycle through the selected colors.

Option/Settings	Description
Center X, Y	Controls the center of the effect. Moving either value changes the horizontal or vertical axis position.
Radius 1, 2	Controls the size of the circle effect by changing the starting or ending radius values. If the Radius 2 value is set to be > than the Radius 1 value, then the effect will contract inwards rather than expand outwards.
Width 1,2	Controls the amount of the colored component of the effect and the rest of the black background component.
Acceleration	Controls the speed at which the effect expands and contracts.
Blend Edges	If selected, the circle colors will have a fuzzy look. If not selected the edges of the circle will have a sharp look.



# Single Strand



## Description

The Single Strand effect is an effect that is used to implement chases and other such staggered effects on models that are single dimensional in nature such as house outlines, arches as well as AC models

Option/Settings	Description
Chase: Colors	Defines whether the Rainbow collection of colors is to be used for the effect or whether colors are to be selected from the Palette. If Palette is selected, then the colors used will be the ones selected via the Color window for the effect.
Chase: Number of Chases	Defines the number of chases. Can be adjusted via the Value Curves options.
Chase: Chase Size	Defines the size of the chase effect as a percentage of the total length of the model that will be on during the chase. Can be adjusted via the Value Curves options.
Chase: Cycles	Defines the number of cycles of the chase that will execute during the timeframe. Can be adjusted via the Value Curves options.
Chase: Chase Types	Defines the direction and type of the chase Left-Right, Right-Left, Bounce from Left etc.
Chase: 3D Fade	Indicates whether a 3D effect should be applied to the chase.
Chase: Group All Arches	When set, will synchronize the chase effect across multiple elements in an Arches model.
Skips: Band Size	Defines the relative size (from one to twenty) of the strand that will be on. Used in conjunction with the Skip Size.
Skips: Skip Size	Defines the relative size (from zero to twenty) of the strand that will be off. Used in conjunction with the Band Size. Examples: A Band Size of 1 and Skip Size of zero will have the entire effect on. A Band Size of 1 and Skip Size of 1 will have half the effect on and half off. A Band Size of 2 and Skip Size of 1 will have half the effect on for two units and off for one unit.
Skips: Starting Position	Used to define the starting position of the first part of the strand that will be on. Advancing this value advances the component of the strand that will first turn on.
Skips: Number of Advances	This defines the relative value of the number of units that the effect will skip before turning on. A value of zero will force the effect to be stationary in one position.
Skips: Direction	Defines the direction of the skip i.e. Left, right, From Middle or To Middle.



# Snowflakes



## Description

The Snowflakes effect paints a picture of falling particles i.e. a similar to snowflakes falling on snow.

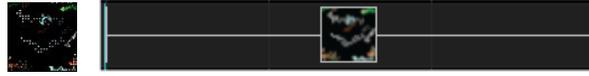
## Prerequisite information

This effect works best with a single color selected. Multiple colors can be selected and depending on the type of the snowflake either one color or multiple colors will be used.

Option/Settings	Description
Max Flakes	Defines the relative % of flakes that should be used for the effect from a small number to a large number.
Type	Up To five different forms of flakes can be generated.
Speed	Controls the speed at which the flakes descend.
Falling	Defines the trajectory of the snowflakes and also whether the whether the snowflakes accumulate at the bottom of the effect or disappear.



# Snow Storm



## Description

The Snow Storm effect paints a picture of particles blowing i.e. a similar to an ice or dust storm..

## Prerequisite information

One or multiple colors can be used for the effect.

Option/Settings	Description
Max Flakes	Defines the relative % of particles that should be used for the effect from a small number to a large number.
Trail length	Defines and controls the length of the trail that the particles leave before fading out.
Speed	Controls the speed at which the flakes descend.



# Spirals



## Description

The Spirals effect provides different representations of two and three dimensional spirals and helix.

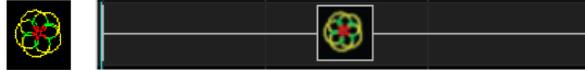
## Prerequisite information

One or multiple colors can be used for the effect. However, this effect looks best with at least two colors selected.

Option/Settings	Description
Palette Rep	Defines the number of times (between one and five) that the selected colors are repeated during the duration of the effect. Can be adjusted via the Value Curves options.
Spiral Wraps	Controls the vertical orientation of the spiral. A value of zero is used for vertical lines and the spirals can be adjusted to lean towards either direction. Can be adjusted via the Value Curves options.
Thickness	Controls the thickness of the strands of the spiral. Can be adjusted via the Value Curves options.
Movement	Controls both the speed and direction that the spirals will move. Can be adjusted via the Value Curves options.
Blend	If set, then all the colors selected are blended together in each strand of the spiral. If not set, then each strand uses a different color.
3D	If set, will provide a 3D type of effects.
Grow	The width of each spiral will grow slightly per cycle as it spins.
Shrink	The width of each spiral will shrink slightly per cycle as it spins.



# Spirograph



## Description

The Spirograph provides an effect described or formed by rolling a circle inside or outside of another circle. The point is placed at any point on the rolling circle.

## Prerequisite information

Only one color can be used for the effect.

Option/Settings	Description
Speed	Defines the speed at which the spirograph will move. Can be adjusted via the Value Curves options.
R - Radius outer circle	This defines the radius of the outer or fixed circle that is used to calculate the spirograph movement. Can be adjusted via the Value Curves options.
r - Radius of inner circle	This defines the radius of the inner or moving circle that is used to calculate the spirograph movement. Can be adjusted via the Value Curves options.
d - Distance	Defines the offset distance of the point of the spirograph that is used to calculate the spirograph movement. Can be adjusted via the Value Curves options.
d - Animation	Defines the level of animation or movement of the spiral away from the axis. A higher value will cause the spiral to expand outwards. Can be adjusted via the Value Curves options.
Length	Defines the length of the expansion of the animation. Can be adjusted via the Value Curves options.

**Note:**  $r$  should be  $\leq R$

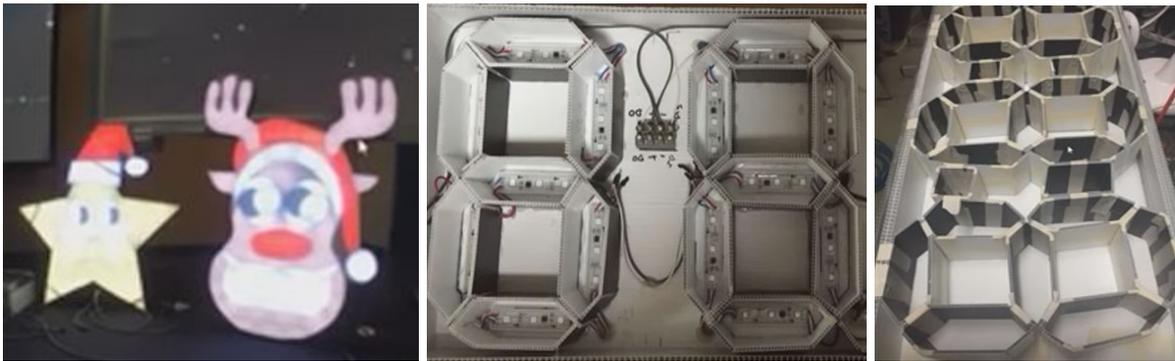


# State



## Description

The State effect is similar to the Faces effect, but enables you to have similar functionality for props that are not standard 'Faces' - such as Reindeer Coro faces , a seven segment FM 'Tune to sign' with a colon and a dot etc (image examples as below):



This effect is somewhat similar to the Faces effects i.e uses many of the same concepts.

However there are a number of differences and therefore this effect can be used when there are a number of 'non standard' elements that you wish to control. You can define upto 40 different combinations of channels to turn on and off (each combination via a state setting).

There are pre defined state values to support numbers and color options to cycle through or allocate specific colors to specific number digits.

## Definition

Create a new Custom Model via the layout tab, named 'Bruno' (representing the reindeer image) for this example . Similar to other custom models, create or import the channel setup.

In a second example in this section , a custom model named 'TuneTo' has been created (representing the numbers in the Tune To image).

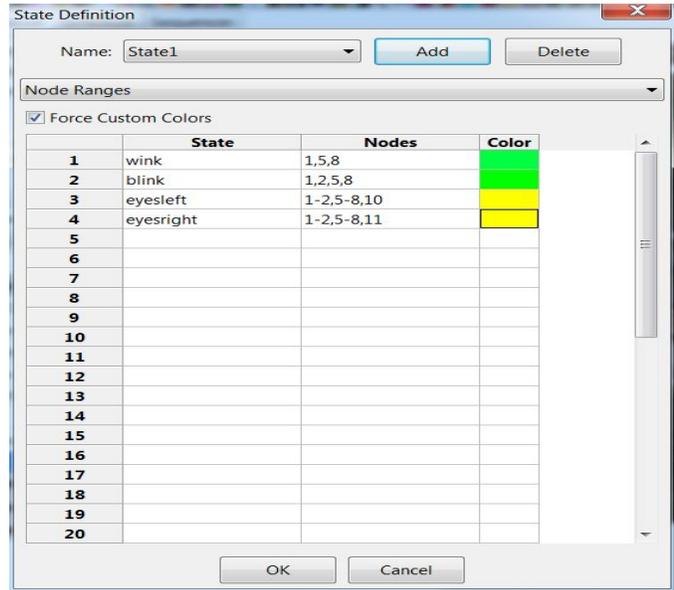
Name	Bruno
<b>Custom</b>	
Model Data	--Click To Edit--
Background Image	<input type="checkbox"/>
Start Channel	1
Preview	Default
Strand/Node Names	--Click To Edit--
Faces	--Click To Edit--
Dimming Curves	--Click To Edit--
States	--Click To Edit-- <input type="button" value="..."/>
<b>String Properties</b>	
<b>Appearance</b>	
<b>Size/Location</b>	



Then click on the State Property, to open up the State definition window.

Click on Add and specify a Name for the State ('State1' in this example). From the drop down box, select either Single Range or Node ranges.

You can specify upto 40 different combinations of states along with the channels to be turned on for each state. In the example, 'wink' will turn on channels 1,5 and 8 and 'blink' will turn on channels 1,2,5,and 8. For this type of effect, any words can be used - just ensure that the same words are used on the timing track and the matching nodes will be turned on.

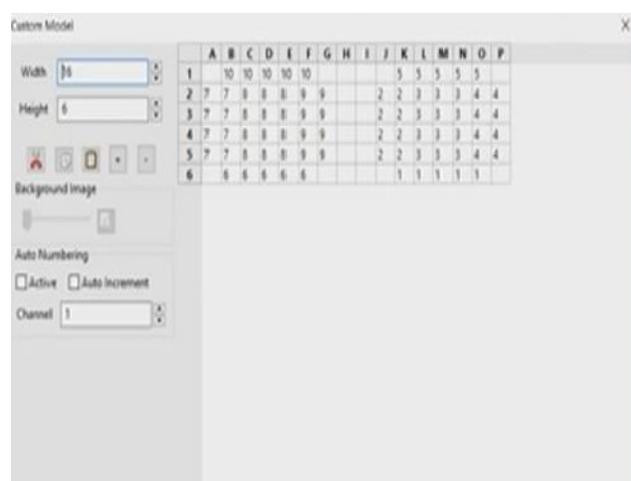
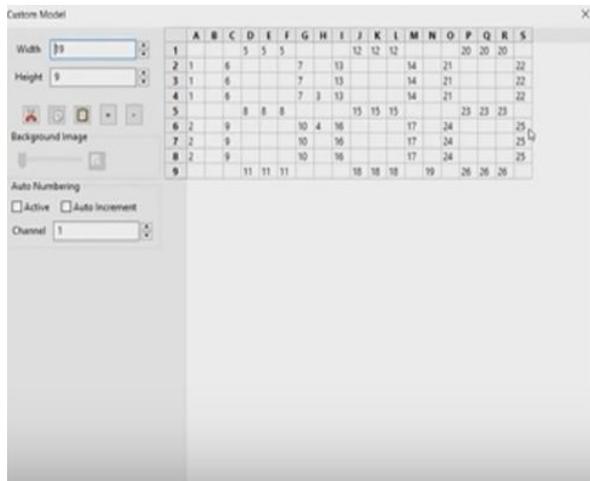


To can define additional or different combinations by creating a new state definition (say State2) and having another set of upto 40 States defined.

The colors to be turned on, by default are sourced from the model properties, but you can force a specific color to be turned on by selecting the 'Force Customs Colors' option which then provides a column to specify the color.

Clicking in a cell in the Color column displays the color palette to pick a color.

Similar to other custom models, create or import the channel setup via the Mode Data attribute of the Model definition.



On the sequencer tab, drop the State effect  against the Custom model (Bruno in this example).

Edit the timing track and enter the labels to match the state definitions. In this example, select the timing track 'New Timing', create two timing bars (press lower case 't' with the cursor in the waveform area), then double



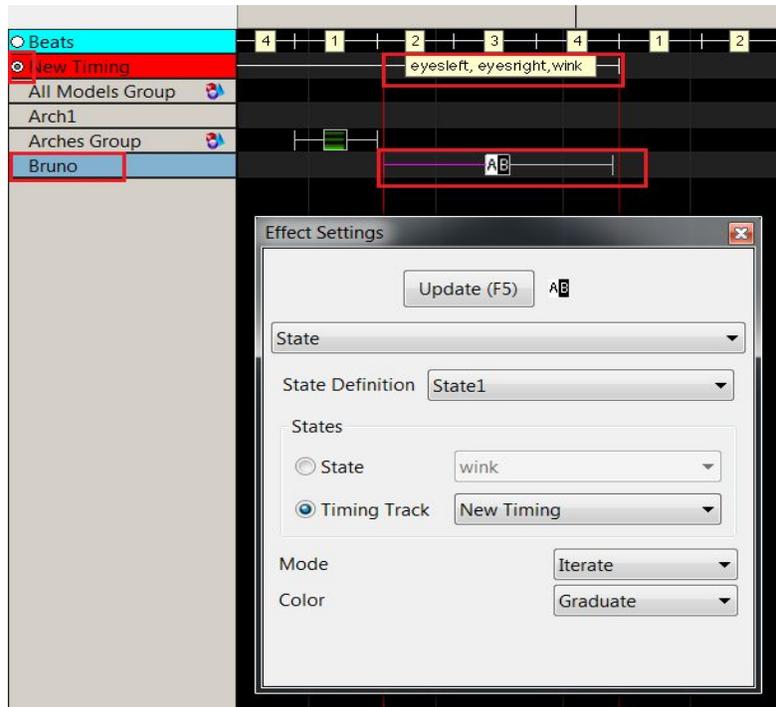
click on the white horizontal line between the two timing marks and enter the label text (eyesleft, eyesright etc) in the pop up window. Ensure that the text exactly matches one of the states defined.

In the Effects setting window, select 'State1' as the state definition, enable and select the Timing Track 'New Timing' as the source and select 'Iterate' as the Mode.

Similar to the way phonemes work on the Faces effect, this will cause the states 'eyesleft', 'eyesright' and 'wink' to be activated.

Iterate causes it to loop around equally for the timespan duration selected for the effect.

You can create multiple Timing tracks and add labels to each track matching the defined states if required.



You can also select a specific State to turn on instead of using the Timing track by checking the State attribute and selecting the State value (wink or another from the drop down list).

If you select 'Default' as the mode, then the selected states will be activated once (with equal duration).

The Color attribute has the following options:

Graduate will start from the first color selected and then transition to the next color.

Cycle will change color at the end of each timing mark.

Allocate will allocate a color to each state ('eyesleft', 'eyesright', 'wink') and turn that color on when that state is activated. The allocation depends on how many colors you have selected and how many states are defined.

Number is used (for number states), to turn the matching number on to that color.

In the example of a 7 segment display below, each number has been created as a state and nodes assigned to it.



The 'Countdown' mode is used to Countdown from a specific number to zero. Specify the starting number in the label (if 123 was used in the example just above in this mode, then it would count down from 123 to zero).

The 'Time Countdown' mode is used to Countdown in seconds from a specific time until the effect duration runs out. Specify the starting time in the label (if 1.30 was used in the example just above in this mode, then it would count down from 1 minute 30 seconds).



In the 4 digit example, States 1 through 0 control the right most digit, States 00 to 90 control the second last digit from the right, 100 to 900 control the 3rd digit from the right and 1000 to 9000 control the first digit.

In the default mode, if you wish to turn on the number '123', then you would specify '100,20,3' (without quotes) in the label on the timing grid.

'Colon' and 'Dot' represent the colon and dot respectively.

These state names are predefined to work for a seven segment display. The nodes however can be assigned to each State/Number as required.

State Definition

Name:

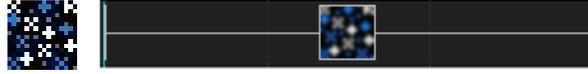
Node Ranges

Force Custom Colors

	State	Nodes	Color
1	1	22,25	Blue
2	2	20,22,24,26	Magenta
3	3	20,22,23,25,26	Blue
4	4	21-23,25	Magenta
5	5	20,21,23,25,26	Blue
6	6	20,21,23-26	Magenta
7	7	20,22,25	Blue
8	8	20-26	Magenta
9	9	20-23,25,26	Blue
10	0	20-22,24-26	Magenta
11	10	14,17	
12	20	12,14-16,18	
13	30	12,14,15,17,18	
14	40	13-15,17	
15	50	12,13,15,17,18	
16	60	12,13,15-18	
17	70	12,14,17	
18	80	12-18	
19	90	13-15,17,18	



# Strobe



## Description

The Strobe effect provides an effect where light particles turn off and on rapidly, but at fixed intervals.

## Prerequisite information

One or multiple colors can be used for the effect.

Option/Settings	Description
Number of Strobes	Controls the number of particles that form part of the strobe effect.
Strobe Duration	Controls the duration of the particles being on; as a result affects how quickly or slowly the particles turn off and on.
Strobe Type	Unused at this stage.
Reacts to Music	If selected - will cause the effect to grow with the intensity of the music.



# Tendrils



## Description

The Tendrils effect provides an effect which looks like a twisting threadlike structure. You can think of tendrils as the pattern you would see if you took a piece of string, held it just above a flat surface and moved it around. As you do so the string would move leaving a trail which did not exactly match the movements but was a result of it. The parameters of the tendrill effect let you control the movement of the string and how the string behaves.

## Prerequisite information

Only one color can be used for the effect.

Option/Settings	Description
Movement	<p>This describes how the end of the string is being moved. Available movements include:</p> <ul style="list-style-type: none"> <li>● Random - The string on each frame is randomly moved somewhere else on the model. This creates dramatic but random movements.</li> <li>● Square - The string is moved around the edge of the model from corner to corner anti-clockwise.</li> <li>● Circle - The string is moved around the centre of the model in a circle clockwise.</li> <li>● Horizontal Zig Zag - the string is dragged left to right and back again across the model slowly moving up and down the model. With the right settings this can almost look like a spiral tree.</li> <li>● Horizontal Zig Zag Return - As per Horizontal Zig Zag , but the string drops down straight to the starting point at the end of the zig zag.</li> <li>● Vertical Zig Zag Return - As per Vertical Zig Zag , but the string returns straight to the starting point at the end of the zig zag.</li> <li>● Music Line - The string is moved left and right across the model with the vertical movement determined by the intensity of the associated music in that frame.</li> <li>● Music Circle - The string is moved in a circle clockwise with the distance the string is from the center of the circle determined by the intensity of the associated music in that frame.</li> </ul>
Tune Movement	<p>The tune movement slider adjusts the current movement. This works differently for each movement.</p> <ul style="list-style-type: none"> <li>● Random - Tunes how far each random movement is. Smaller means smaller movements.</li> <li>● Square - Tunes how many steps the string takes moving from one corner to the next. Larger numbers make the movement slower</li> <li>● Circle - Tunes how many degrees the string takes moving around the circle. Larger numbers make the movement faster.</li> <li>● Horizontal Zig zag - Tunes the number of zig zags on each traversal of the model. Large numbers reduce the number of traversals.</li> <li>● Vertical Zig zag - Tunes the number of zig zags on each traversal of the model. Large numbers reduce the number of traversals.</li> <li>● Music Line - Tunes the speed the line travels left and right across the model. Large numbers speed up the line.</li> <li>● Music Circle - Tunes the speed the line travels around the circle. Large numbers speed up the line.</li> <li>● Speed - This allows you to lower the frame rate. 10 is full speed. Anything lower will make the movement slower and jerkier.</li> </ul> <p>Can be adjusted via the Value Curves options.</p>



Thickness	This is how thick the string is. By default it is just 1 pixel wide. Can be adjusted via the Value Curves options.
Friction	Friction is how much the surface resists the string moving. When set low friction is high and the string won't move much. When set high the string will wildly flap about.
Dampening	Controls how quickly the string will try to resume being in line with the tail point. When set low it will come back quickly. When set high it can take a long time to align.
Tension	This behaves much like dampening. Set low and the tail of the string will tend to stay still and only the moving end will move much.
Trails	The effect can draw multiple lines (not just the one). On low resolution displays or when thickness is set high it won't be seen. On higher resolution displays, if you set this to higher numbers, you will see the tendril fray into multiple related lines like a partially unravelled rope.
Length	This is how long the string is. By default it is 60 segments long.
Speed	This enables you to lower the frame rate. 10 is full speed. Anything lower may make the movement slower and jerkier
Horizontal, Vertical Offset	Enables adjustment to the starting position of the effect horizontally and/or vertically. Can be adjusted via the Value Curves options.
Manual X, Y	Controls the X and Y positions of the effect. Can be adjusted via the Value Curves options.



# Text



## Description

The Text effect enables upto 4 lines of text, all individually controlled to be displayed. The content of the text can be static, but can also include countdown timers.

## Prerequisite information

One color can be selected for each line of text. Each line can have a different color.

Click on the tab (i.e. Line1.. Line4) to select the Line of text to be defined.

For each line of text, the following settings can be defined:

Option/Settings	Description
Text	Contains the text that is to be displayed for the line.
Font	Defines the font that is to be used for the text. Click on the attribute to open up a window where the type of font, style, size, color and other related attributes can be defined.
Movement C	Defines the direction of the movement of the line of text. One of several options are possible such as Left, Right, Down, None, etc. If the box next to the Movement setting i.e. 'C' is ticked, then the text will reach the center and stop. When the Vector option is selected, the Start Position and End Position tabs at the bottom are used to adjust the motion. 0,0 is the middle position. It defaults to offsetting with the values being percentages of the model size but if you check the Offsets in Pixels box it becomes number of pixels.
Speed	Controls the speed at which the line of text moves.
Effect	Controls the layout of the line of text. The default is 'Normal', however other options to rotate the text at different angles are possible.
Countdown	Defines whether the line of text is to be used as a Countdown Timer. The default value is 'None' indicating that it is not a Countdown Timer effect. For a count down effect, the following options are possible and count down will be based from the time the effect is rendered or finally saved and not from when it is executed in the sequence. The concept of the count down timer stems from New Year's Eve countdown displays. If one knows exactly when the countdown will start, then setting this to an appropriate date/time is a non-issue.  The date/time must conform the the RFC822 standard format. Properly formatted examples are: Fri, 25 Dec 2015 00:00:00 +0100 Fri, 25 Dec 2015 00:00:00 EST Fri, 25 Dec 2015 00:00:00 MST Fri, 25 Dec 2015 00:00:00 -0800



	<p>These must be specified in the Text field without any quotes.</p> <table border="1"> <thead> <tr> <th>Option</th> <th>Format</th> </tr> </thead> <tbody> <tr> <td>seconds</td> <td>100 Will execute a 100 second countdown</td> </tr> <tr> <td></td> <td>In the following examples '+0100' refers to your time +GMT hours. Change accordingly. Or you can use GMT, EST etc.</td> </tr> <tr> <td>to date 'd h m s'</td> <td>Fri, 25 Dec 2015 00:00:00 +0100 Will display 33d 3h 38m 14</td> </tr> <tr> <td>to date 'h:m:s'</td> <td>Fri, 25 Dec 2015 00:00:00 +0100 Will display 3h 38m 14 - the time is calculated to the next day in hours, mins, secs</td> </tr> <tr> <td>to date 'm' or 's'</td> <td>Fri, 25 Dec 2015 00:00:00 +0100 Will display 217m - the time is calculated to the next day in minutes</td> </tr> <tr> <td>to date 's'</td> <td>Fri, 25 Dec 2015 00:00:00 +0100 Will display 13011 - the time is calculated to the next day in seconds</td> </tr> <tr> <td>!to date !%tofmt</td> <td>/Fri, 25 Dec 2015 00:00:00 +0100/ %D Will display 133</td> </tr> </tbody> </table>	Option	Format	seconds	100 Will execute a 100 second countdown		In the following examples '+0100' refers to your time +GMT hours. Change accordingly. Or you can use GMT, EST etc.	to date 'd h m s'	Fri, 25 Dec 2015 00:00:00 +0100 Will display 33d 3h 38m 14	to date 'h:m:s'	Fri, 25 Dec 2015 00:00:00 +0100 Will display 3h 38m 14 - the time is calculated to the next day in hours, mins, secs	to date 'm' or 's'	Fri, 25 Dec 2015 00:00:00 +0100 Will display 217m - the time is calculated to the next day in minutes	to date 's'	Fri, 25 Dec 2015 00:00:00 +0100 Will display 13011 - the time is calculated to the next day in seconds	!to date !%tofmt	/Fri, 25 Dec 2015 00:00:00 +0100/ %D Will display 133
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Position	<p>This setting is used to adjust the initial position of the text. Either the vertical (Y) or the horizontal (X) position of the text is adjusted, depending on the value of the 'Movement' setting. For a value of 'None' or a horizontal movement such as Left / Right, adjusting the setting will move the initial position of the text vertically.</p> <p>Only the first line of text can be controlled vertically and horizontally. The other lines have a horizontal control only.</p> <p>You can however use multiple Layers each with one or more text lines if required.</p>																



**Tip:** In order to stop the text after one cycle, use the "Vector" Movement option and define your vector motion. It will complete that motion in the duration of the effect. This option can also be used to stop text at a particular point on a matrix.



# Tree



## Description

The Tree effect creates a series of zigzag branches against a colored background. This effect is best used against a tree type of model such as a mega tree.

## Prerequisite information

The first color selected will be used as the background color for the model (i.e. the mega tree). Subsequent color(s) will be used for each branch.

Option/Settings	Description
Number Branches	Defines how many individual branches are created for the effect.
Speed	Controls the speed at which the lights of the branch move across the effect.



# Twinkle



## Description

The Twinkle effect provides an effect of individual particles turning off and on slowly or rapidly, similar to the shimmer effect but with a different and more random implementation.

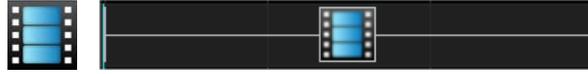
## Prerequisite information

One or multiple colors can be used for the effect.

Option/Settings	Description
Number Lights	Defines and changes the number and pattern of the lights twinkling from a scattered pattern, to lights closely aligned, to an intense pattern.
Twinkle Steps	Controls the speed and accordingly the smoothness with which the colors of the lights change.
Strobe	If selected, will generate a strobe like effect to the twinkle.
Re-randomize after twinkle	



# Video



## Description

The Video effect enables a video media file to be selected and directly played as a video clip sequence.

## Prerequisite information

A video file that will be used for the effect. Supported file types are \*.mp4, \*.mpg, \*.avi, \*.mov, \*.flv, \*.mkv and \*.asf files.

Option/Settings	Description
Video Location	Identifies the name and location of the video file to be played.
Start Time	Defines the point in the video at which the effect should start playing. The default is to start from the beginning.
Duration Treatment	Normal, Loop , Slow/Accelerate. Normal will play the video once for the duration specified. If the length of the video is less than the duration , the effect won't be active after the video ends. Loop will loop to the beginning and play the video again if it ends before the duration of the effect. Slow/Accelerate will adjust the video speed to fit the duration.
Maintain Aspect Ratio	If selected , then the video aspect ratio (16:9 or 4:3) will be used, else the effect will attempt to change the aspect ratio to better match the model dimensions.

The video duration is adjusted to fit the time that is selected for the duration effect. If the video duration is shorter than the time selected, then the video will loop to fit the duration.



**Caution:** If you move the image that you have used for the video effect to a different location or delete it, when you next run the sequencer, if the image is not found, an error message will not be displayed, but the effect will render a blank image. The only time this won't happen is if only the drive letter has changed, and the rest of the path is the same.



# VU Meter



## Description

The VU Meter effect displays a volume meter type of effects that responds to the sound level of an audio track. Each bar represents a note on the scale and the height of each bar represents the intensity.

## Prerequisite information

Select one or more colors. The On effect type shows brightness equivalent to the volume of music, so is suited for music with loud distinct beats. The Level Pulse effect type pulses when the audio gets above a certain level. Reduce the sensitivity to make it less white. Once triggered it goes white and fades. If it hits the level again it will go bright again. If your sensitivity is too low it just stays on.

Option/Settings	Description
Bars	Controls the number of bars to be used for the effect.
Type	<p>Controls the type of Waveform that is displayed. Options are: Spectrogram, Volume Bars, Waveform, Timing Event Spike, Timing Event Sweep, On, Pulse, Intensity Wave, Level Pulse, Level Shape, Color On, Timing Event Color, Timing Event Jump, Note On, Note Level Pulse.</p> <p>'Timing Event Color' will change color based (from the palette) triggered on the timing of the Timing Track selected.</p> <p>'Color On' will change color (from the palette) as the intensity of the music increases.</p> <p>'Note Level Pulse, will turn on a color (i.e pulse) when the note range crosses the sensitivity level and then quickly fade out.</p> <p>Timing Event Jump will cause a Spike at each event (i.e. bars/beats) of the timing track selected.</p>
Timing Track	Defines the timing track from the sequence against which the effect will be generated. This is only available for some types of effects as in other cases the effect is generated off the audio level or audio spectrum.
Sensitivity	Applicable for the Level Shape and Level Pulse effect types. Controls the threshold level of the music at which the effect gets triggered. The effect will last as long as the intensity is above the threshold.
Shape	Enabled when the Type attribute is 'Level Shape'. Options are: Circle, Filled Circle, Square, Filled Square, Diamond, Filled Diamond
Start Note, End Note	Controls (narrows) the range of notes (MIDI values) that are used for the effect i.e notes outside this range will be filtered out. Useful to filter out the bottom notes or the top notes in different songs. Value 60 corresponds to 'Middle C'.
Horizontal offset	This attribute adjusts the center of the effect horizontally.
Vertical offset	This attribute adjusts the center of the effect vertically. Can be adjusted via the Value Curves options.



# Wave



## Description

The Wave effect generates a waveform effect across the model. Different types of waveforms are possible as described below.

## Prerequisite information

One or multiple colors can be used for the effect.

Option/Settings	Description					
Wave Type	<p>Defines the type of waveform to be generated by the effect:</p> <table border="1"> <tr> <td>Sine</td> </tr> <tr> <td>Decaying Sine</td> </tr> <tr> <td>Square</td> </tr> <tr> <td>Triangle</td> </tr> <tr> <td>Fractal/Ivy</td> </tr> </table>	Sine	Decaying Sine	Square	Triangle	Fractal/Ivy
Sine						
Decaying Sine						
Square						
Triangle						
Fractal/Ivy						
Fill Colors	<p>Defines the color of color selection to be used for the waveform.            If 'None' is selected, only the first color selected is used.            If 'Palette' is selected, then the colors selected from the color palette are used.            If 'Rainbow' is selected, then the colors selected from are from the rainbow palette.</p>					
Mirror Wave	<p>If this setting is selected, a mirror image of the waveform is also generated.</p>					
Number of Waves	<p>Controls the formation of the speed at which the waves are formed.            Can be adjusted via the Value Curves options.</p>					
Thickness of Wave	<p>Controls the thickness of the waveform.            If multiple colors have been selected, as the thickness increases, then the different colors form part of the waveform.            For a thin wave, the first color selected is used.            Can be adjusted via the Value Curves options.</p>					
Scale Height of Wave	<p>Defines the height of the waveform.            Can be adjusted via the Value Curves options.</p>					
Speed	<p>Controls the speed at which the wave moves across in the specified direction.            Can be adjusted via the Value Curves options.</p>					
Wave Direction	<p>Defines whether the wave moves from Left to Right or Right to Left.</p>					