Truelight

Version 2.1

Shake Node

FilmLight
DIGITAL FILM TECHNOLOGY

Truelight

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Shake Node

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Truelight Overview

Truelight is a complete film colour management system for pre-visualising film images on electronic display devices. It provides a full simulation of the entire workflow from digital data to final projected image. By carefully measuring and characterising each stage in the workflow, the closest possible match between preview on the Shake monitor and the final projected film image can be achieved.

The simplified overview diagram below shows how the Truelight system uses calibration data to create a 3D colour-cube transform, accurately matching the electronic display of digital film images to the projection of a print created from the same digital source:
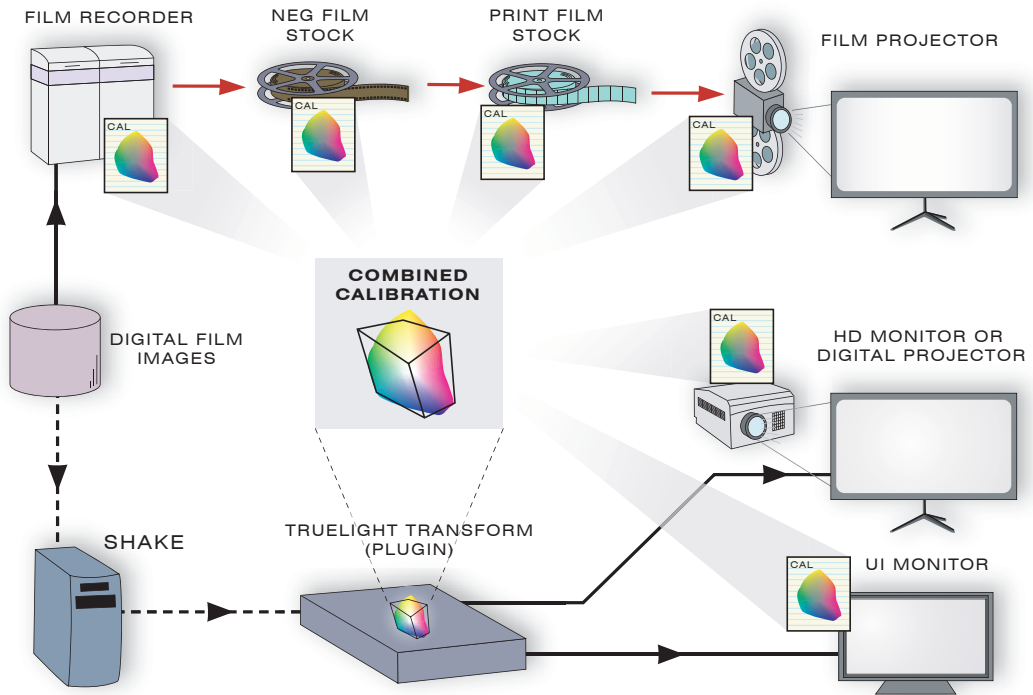
For more details on Truelight, please visit the **Film**Light web pages at www.filmlight.ltd.uk, and follow the product link to the Truelight sections.

Truelight Licence

Truelight is automatically licensed to use generic profiles. The Truelight node can be upgraded to load custom profiles if required.

For further information, please refer to the Truelight support section of the **Film**Light website:

www.filmlight.ltd.uk/support/truelight.html

Monitor Calibration

A monitor must be correctly calibrated before it can accurately reproduce images. The Truelight node provides a built in tool for the visual calibration of the Shake monitor. It is also possible to use monitor calibration files which have been created using a Truelight Monitor Probe and imported into the machine.

Before calibrating the Shake monitor, it should be set up to ensure optimal performance in your current viewing environment. You should use the controls on the display to set the brightness, the contrast, and the white point. The **Film**Light recommended practice document *RP-FL001* "*Viewing Environment and Monitor Setup*" gives more detailed advice on setting up your viewing environment - this can be downloaded from the **Film**Light website.

The following procedure applies to the visual calibration of the Shake user interface monitor. If you have an external HD broadcast monitor, Truelight provides two preset calibration options which may be appropriate for your monitor (see step 5 on page 8).

(i) Before starting, ensure that the VLUT and user scripts are switched off: vlut off

To start the Truelight Monitor Calibration utility:

1	Click on the '**other**' tool tab

**2**	This tab should include two Truelight icons - click on the Truelight Calibrate icon:

➜	A 'TLCalibrate' node will appear in the Node View. This node does not require any inputs or outputs as it is just being used to generate a series of lineup patterns in the viewer:
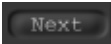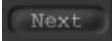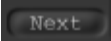

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3 The viewer should currently be displaying two patches side-by-side, a mid grey patch on the left and a patch composed of alternate white and black lines on the right. Select the Parameters1 tab to access the Truelight monitor calibration controls:
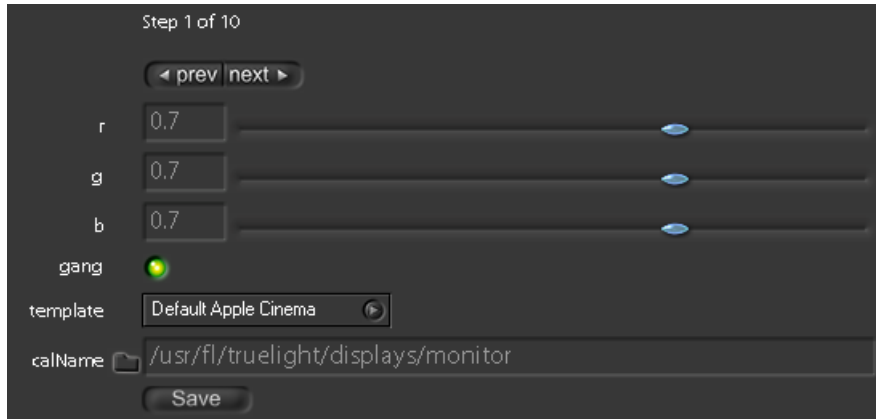
Before adjusting any of the controls, check that the 'useProxy' setting in the 'Globals' parameter tab is set to 'Base', and the viewer is set to a 1:1 zoom. If necessary, click on the viewer **Home** button to reset the viewer.

4 Leave the **gang** button turned on so that all three sliders move together and then drag any of the rgb sliders to the left or right, to visually match the 'brightness' of the two halves of the screen.

➜ It may help to view the screen through half-closed eyes so that the white/black lines on the right-hand side of the viewer appear to merge into a continuous grey patch.

5 If there is any noticeable colour cast on the left side of the screen compared to the right, click on the **gang** button to turn it off and then trim the rgb sliders independently to match the colour of the two patches.

6 Once the two halves of the viewer match, and there appears to be a single uniform grey patch across the whole monitor, click on the 'Next' **step** button [Next]

➜ Two new patches appear at half the level of the previous ones (i.e. one stop less), and the step number shown above the rgb sliders increments.

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7   Repeat the process of matching the two halves of the screen as described above and again, click on the 'Next' **step** button [Next]

8   Repeat the process a further eight times to match all ten sets of grey patches. If the patches are too dark to see any differences, just click on the 'Next' **step** button [Next]

➔   Note that it is possible to step back to a previous grey level at any time by clicking on the 'Prev' **step** button [Prev]

Once all the patches have been matched, the monitor calibration data must be saved:

9   Click on the **template** button to choose a calibration template appropriate to the type of monitor you have (currently, Apple Cinema and CRT displays are supported).

ⓘ   The template list will also include any existing monitor calibration files, including ones created using a Truelight Monitor Probe. You can use a previous calibration as a template. The new calibration will have new RGB tone curves, but the other display properties are inherited from the template file.

10   Type a file name for this monitor calibration data in the **calName** box, and then click on the 'Save' button [Save] (note that the default name for this file is 'monitor').

    Note that if the chosen calibration file already exists, a warning message will appear asking whether you want to overwrite it. Cancel if you do not.

    The **calName** box has a browser control. You can put calibrations in other directories, but the default directory is where Truelight will expect to find them.

The monitor has now been calibrated for use with Truelight and the 'TLCalibrate' node can be deleted.

❗   Warning: If you alter the display controls now, your new calibration will be invalid. Please lock or disable any controls on your monitor, if you can.

ⓘ   Note that the calibration tool only calibrates the tone curves. It cannot measure the absolute brightness or colour of your monitor. The standard Apple Cinema and CRT templates use the Truelight default white point (16 foot-lamberts D65). If you are using a Truelight Monitor Probe calbration as your template, then you will get the correct absolute white point for your monitor. For more details see Truelight note FL-TN-00-001 on the **Film**Light website.

(i) Calibrations based on the standard Apple Cinema and CRT templates link display RGB values to absolute colours in CIE XYZ. Truelight also supports display calibrations that link display RGB values to colours relative to the display white in CIE L*a*b*. For more details on these standard colour spaces see Truelight note FL-TN-00-002 on the **Film**Light website.

The Truelight Viewer

Once the Shake monitor has been calibrated (see *Monitor Calibration* on page 3), a Truelight node can be added to provide an accurate preview of what the final film print will look like:

1   Select the **color** tool tab.

2   Click on the Truelight Viewer icon:

➜   A **Truelight** node will appear in the Node View. Insert the Truelight node into the tree at the appropriate point.

3   Click or double-click on the Truelight node to load its parameters:
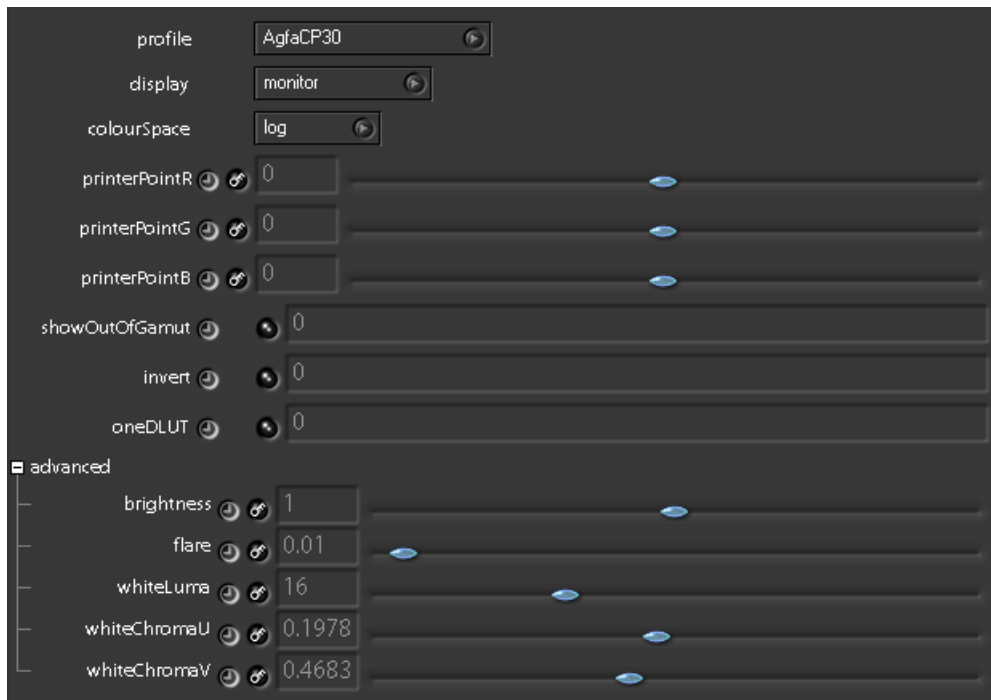
4   Click on the **profile** button and select a Truelight profile from the pop-up list which matches the film-out process (print stock) you are simulating.

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(i) The default profile set is based on different film stocks, projected with a standard xenon lamp. Advanced users can make their own profiles using a text editor (for more details see Truelight note FL-TN-00-003 on the **Film**Light website). If you require detailed simulation of your light box, projector, or specific film-out process, please contact **Film**Light for information on alternative profiles and customised calibrations.

5   Click on the **display** button to choose the monitor calibration file for your display. If you have not yet calibrated the Shake monitor, please use the Truelight Calibration utility (see page 3). The list of display calibrations will include three standard files - **rec709**, **rec709legal,** and **SonyHD**. These calibrations are normally used in conjunction with an external broadcast monitor. The two **rec709** calibrations match the standard ITU broadcast formulae; **SonyHD** matches a typical well-set up HD monitor.

6   Finally, click on the **colourSpace** button to set the correct working colour space for your material. The options are 'log', 'linear' and 'video'. These settings correspond to the basic colour space settings in the Shake **LogLin** node, but without the additional parameters (see *Appendix* for more details).

The Truelight node should now be set up to correctly simulate the chosen film-out process on the calibrated Shake monitor.

(i) Note that the screen shot on the previous page shows controls for white point luminance ('whiteLuma') and chrominance ('whiteChroma') at the bottom of the 'advanced' drop-down section. These controls are only shown if the currently selected display needs them. If you cannot see these three sliders, then you may be using a CIE L*a*b* display calibration.

Note also that there are three printerPoint controls. These controls are only shown if the currently selected profile can use them. If you cannot see the three 'printerPoint' sliders, then you may be using a profile that matches your display to another display. In this case, the profile is not simulating a film-out process, so these controls would have no function.
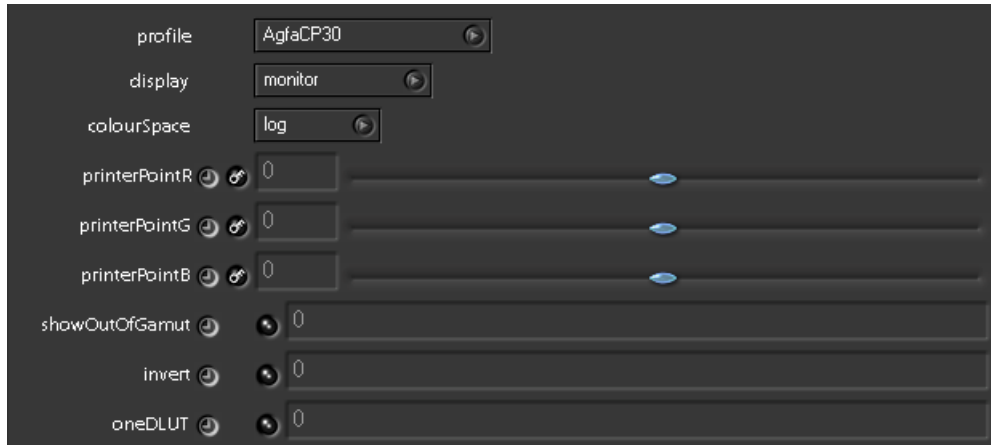
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Viewing controls

When viewing a Truelight node, the images displayed should be an accurate representation of what you would see if the image data were recorded and printed to film, then projected on the cinema screen. Ideally there should be no need to adjust anything. However, sometimes the user needs to adjust the display to compensate for 'external' factors not modelled within the Truelight profile.

❗ Note: It is very important that the user does not adjust any of the controls on the monitor itself once it has been calibrated. If the monitor controls are adjusted, the monitor will have to be re-calibrated (see page 3).

The **Parameters1** tab contains the following controls to allow for adjustments to the simulation of printer points and also to enable other Truelight modes:

printerPointR,G,B –	These controls allow offsets to be applied to the Truelight simulation of printer lights at the printing stage of the film-out process. Adjust them to match a print which has come out with a colour cast. The default setting is zero. These sliders may be hidden if, for example, the currently selected profile does not simulate a film-out process.
showOutOfGamut –	Click on this toggle button to turn on Truelight's gamut alarm (see page 11). When active, any out-of-gamut' colours are highlighted.
invert –	Click on this toggle button to invert the operation of the Truelight node. An inverted node will turn display RGB into film data.

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oneDLUT	– Click on this toggle button to replace the Truelight cube transform with simple look-up tables. This is slightly faster, but it is only accurate for neutral tones. When this control is enabled the 'showOutofGamut' control is hidden as it will have no effect.

Expanding the '**advanced**' section at the bottom of the panel provides access to additional controls to compensate for ambient lighting conditions. Adjustments can also be made to the white point (luminance and colour temperature) of the display:

brightness	– The brightness level of the displayed image can be shifted up or down. If you are working under office lighting, you may want to turn up the brightness.
flare	– When ambient light levels are high, detail in the darker areas of an image can become difficult to see. Flare correction can be applied to effectively 'stretch' the black end of the gamma curve. This is useful when it is impractical to black out the room. The default value of 0.01 matches the reference cinema conditions.
whiteLuma	– Sets the maximum white output level of the monitor. The default setting is appropriate for matching cinema conditions. This control is hidden if the current display calibration does not use it.
whiteChromaU,V	– These two sliders adjust the overall colour balance of the monitor. Changing the 'u' value shifts the white point towards red or green. Changing 'v' shifts white towards yellow or blue. The default settings shown match D65, the white used in video standards. These controls are hidden if the current display calibration does not use them.

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Viewer LUT

Truelight can also be selected as a viewer LUT. Right click on the viewer LUT control to access the parameters.

Gamut alarm

Some colours can be displayed on film but cannot be reproduced on a particular electronic display such as an LCD or CRT monitor. These colours are considered as 'out-of-gamut' for that display device. When the showOutOfGamut button is enabled, these out of gamut colours are highlighted and the colours in gamut are rendered neutral. In normal operation, when the Gamut Alarm is disabled, the Truelight system gets as close to the colours as the display gamut allows.

Troubleshooting

The viewer will put a yellow cross over the image if there is a problem with the viewer settings or profile. This is most likely to be because the default 'monitor' display calibration hasn't been created (see page 3).

For further assistance please visit the Truelight FAQs page in the Truelight support section of the **Film**Light website: www.filmlight.ltd.uk/support/truelight.html

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Support Information

Further information, support and FAQs can be found in the Truelight support section of the **Film**Light website:

http://www.filmlight.ltd.uk

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Appendix - Colour Space Conversions

Truelight can work with data which represents images in either log, linear or video colour space. When setting up the Truelight node, it is important to choose the correct input colour space for the images you are working with (see page 8).

The example shown here illustrates how Truelight should be set to simulate a print on Kodak Vision stock on your display with three different input data types:

Case 1 - Image data is Cineon Log

– To preview how images stored in logarithmic format (densities) would print on Kodak Vision stock, set Truelight input colour space to "Log", profile to "Kodak Vision" and choose your calibrated monitor for the monitor

Case 2 - Image data is Linear

– To preview how photometrically linear images (gamma=1.0) after conversion to logarithmic space would print on Kodak Vision stock, set Truelight input colour space to "Lin", profile to "Kodak Vision" and choose your calibrated monitor for the monitor

Case 3 - Image data is Video or HD

– To preview how video or HD originated images would print on Kodak Vision stock, after conversion to logarithmic space, set Truelight input colour space to "Video", profile to "Kodak Vision" and choose your calibrated monitor for the monitor

To get a better idea of the input conversions within a Truelight node, the above cases for Linear and Video input data can also be represented by Shake nodes providing similar results:
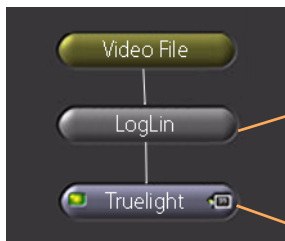
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Linear Image Data
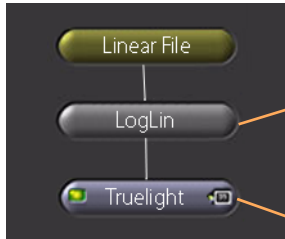

```
LogLin Settings:

conversion = 0; /* log to lin */
rOffset = gOffset = bOffset = 0;
rBlack = 95;
rWhite = 685;
rNGamma = 0.6;
rDGamma = 1.7
rSoftClip = 0
```

```
Truelight Settings:

colourSpace = "Lin";
profile = KodakVision;
display = my_monitor;
```

Video Image Data


```
LogLin Settings:

conversion = 1; /* lin to log */
rOffset = gOffset = bOffset = -8;
rBlack = 95;
rWhite = 685;
rNGamma = 0.6;
rDGamma = 0.7727; /* 1.7/2.2 */
rSoftClip = 0
```

```
Truelight Settings:

colourSpace = "Log";
profile = KodakVision;
display = my_monitor;
```

ⓘ Note that the Truelight node is designed as a viewing node but there is no restriction against using it in the middle of a tree. Internally, the node limits the floating point range to between 0 and 1. If the Truelight node is used in the middle of a tree, please be aware that clipping could occur if the image data goes above 1.0

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