CompactDesigner CompactControl Procedure

COLOUR AND BRIGHTNESS OPTIMISATION

DOCUMENT STATUS

Revision	Month Year	Paragraph(s)	Prepared by	Description of Change
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1.　INTRODUCTION

This document is produced with the intention of describing the procedure for optimizing 3D perception's CompactView Clan projectors colour and brightness.

The procedure is meant as a guideline only and will not guarantee equality between channels.

Colour and brightness adjustments are performed differently from person to person, due in the main to the fact that each individual's perception of light and colour can be vastly different. However, following this procedure should be a good starting point. Some prior knowledge of 3D perception's CompactControl is recommended.

2.   AVAILABLE CONTROLS:

The available controls for colour and brightness adjustments are found on different parameter dialogue pages. All controls are available through CompactControl, apart from the projectors built-in gamma schemes.

Several of the control settings can be found by using either CompactControl or the projectors remote control / touch panel. It is however recommended to only use the CompactControl interface for adjustments. This will ensure that all settings will be saved in the proper manner and not re-set when re-opening a design file from CompactControl or re-setting the projector.

Contrast (white level)
Brightness (black level)
Gamma
Colour Balance
Input offset (Black level balance)
Input gain (White level balance)
Primary colour adjustments
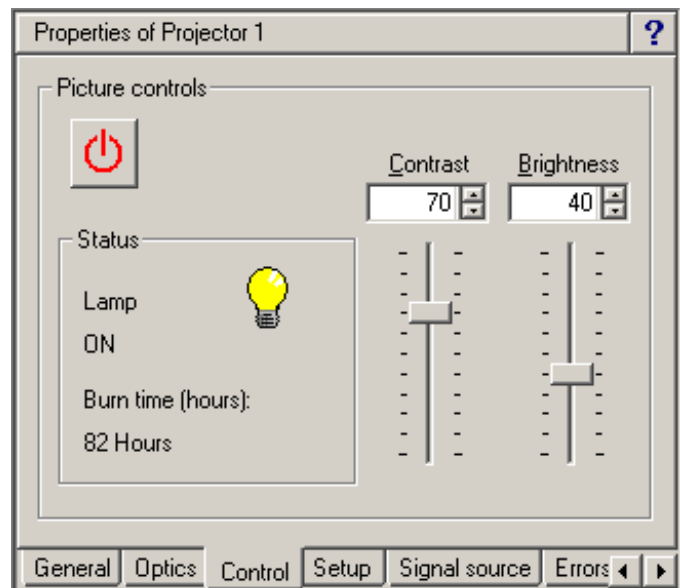**Projector built-in gamma schemes**

2.1   Contrast

The Contrast control is found on the projectors Control dialogue page

Contrast is used to control a projectors white level.

Adjusting the contrast will adjust the light levels for all colours equally.
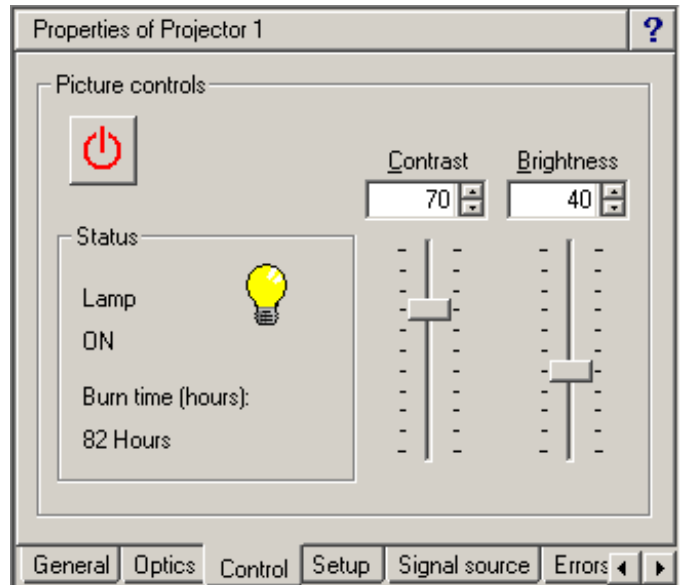
Default setting is 70.

2.2   Brightness

The Brightness control is found on the projectors Control dialogue page

Brightness is used to control a projectors black level.

Adjusting the brightness will adjust the dark levels for all colours equally.

Default setting is 40.

2.3   Gamma

The Gamma control is found on the Gamma Adjustment General dialogue page

Gamma has a dual purpose.

1.   To compensate for individual colours' non-uniformity issues in the transformation between different light levels.

2.   To effectively remove artefacts caused by the lack of anti-aliasing and/or excessive geometry correction.

Default setting is 1.0.
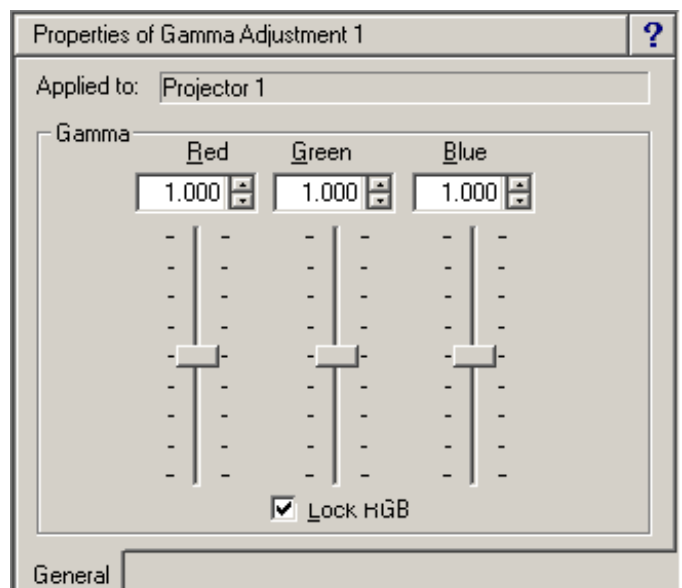
2.4   Colour Balance

The Colour Balance control is found on the Colour Adjustment General dialogue page

The use of the general colour balance adjustments may cause problems with uniformity when changing from dark to bright images.

Typically they should be used when projectors other than 3D perception's CompactView Clan projectors are connected and black/white level control of individual colours is not present.
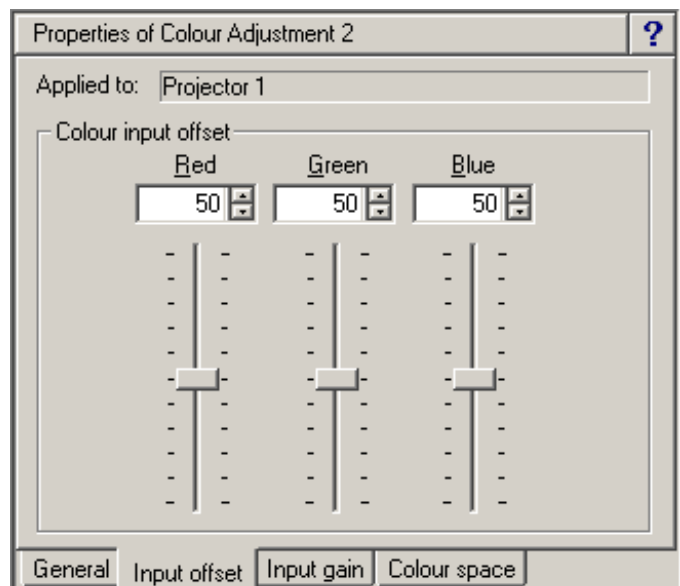
Default setting is 1.0.
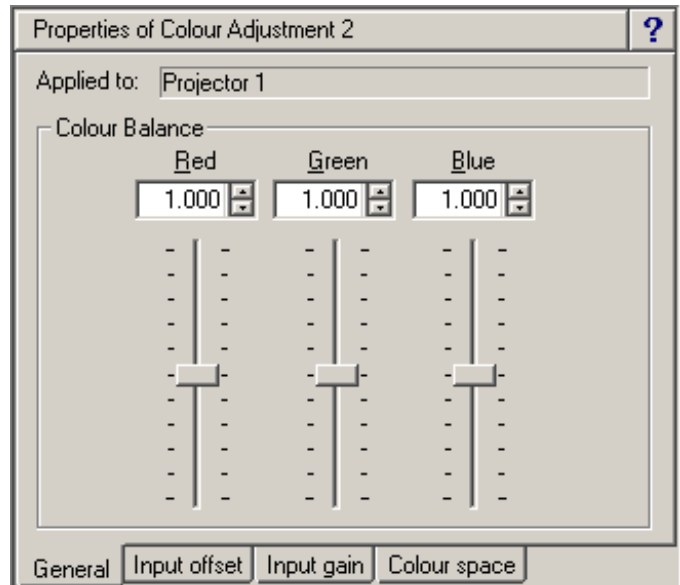
2.5   Input offset

The Input offset control is found on the Colour Adjustment Input offset dialogue page

Input offset is used to control the individual black level.

Setting the RGB values correctly in conjunction with contrast and brightness should ensure a uniform image across different light levels.
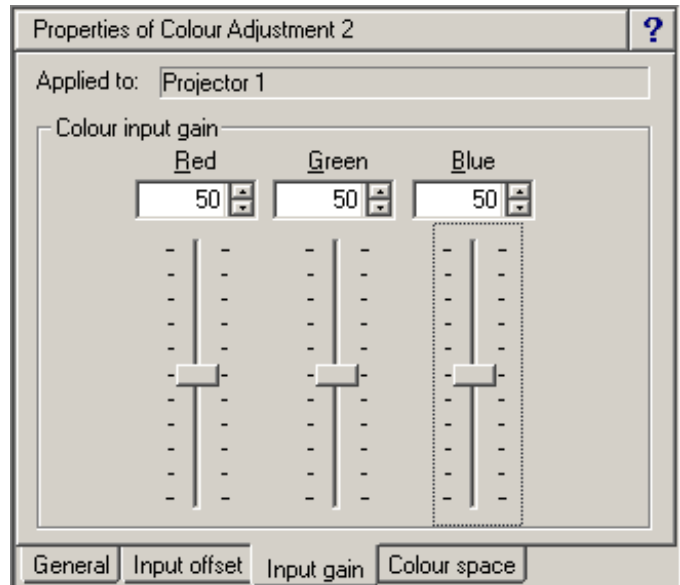
Default setting is 50.

2.6 Input gain

The Input gain control is found on the Colour Adjustment Input gain dialogue page

Input gain is used to control the individual white level.

Setting the RGB values correctly in conjunction with contrast and brightness should ensure a uniform image across different light levels.

Default setting is 50.

2.7 Primary colour adjustment

The Colour space control is found on the Colour Adjustment Colour space dialogue page

Primary colour adjustment is ideally used in conjunction with a colour meter, such as the Compact ColourMatcher, but may also be adjusted manually.

Primary Colour Adjustment will enable the user to mix primary colours with components of the other primary colours. Primary colour adjustment can for instance add parts of blue and green to the primary red.

Default setting is 1,0,0; 0,1,0; 0,0,1.
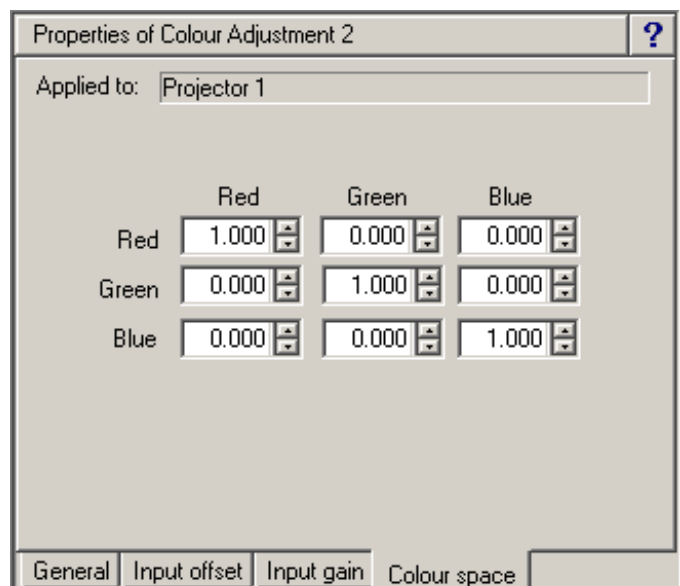
2.8   Projector built-in gamma schemes

3D perception's CompactView Clan projectors have their own built-in gamma schemes. The recommended setting in order to achieve true and uniform colours is either 'Photographic' or 'Film 2' depending on the type of projector. This must be set using the projectors remote control or touch panel.

3.   TYPICAL PROCEDURE

1.   Reset all image generators.
Ensure sure all image generators are reset such that all colour, brightness, gamma, etc. settings are set to default. In some image generators, gamma may be set with a default of more than 1.0. To ensure that gamma is set to default on all image generators' set gamma to 1.0 at the All Gamma adjustment level.

2.   Cabling.
Cables are a common known source for creating noise and colour differences in projectors. Make sure all cables are of good quality. This is usually not the best place to save money, although this is regrettably often the case. DVI cables are highly recommended and alternatives for long cable runs with DVI are commonly available today with both copper and optical cables.

3.   Sort your projectors.
Sort projectors in such a way that where there are differences in colours between projectors, those that are most similar to each other are positioned next to each other.

4.   Projector built-in gamma schemes.
Set the projectors built in gamma scheme to either 'Photographic' or 'Film 2'. The 'High Brightness' option will boost white and hence cause problems with adjusting light levels and colours due to non-linearity of grey levels. Equally it is recommended to set the 'White Boost' level to 0 (zero) if available.

5.   Gamma.
Add gamma adjustments to all channels and set them all to be between 1.2 and 1.3

Note: All channels should be set equal and this can best be done at the All Gamma adjustment level
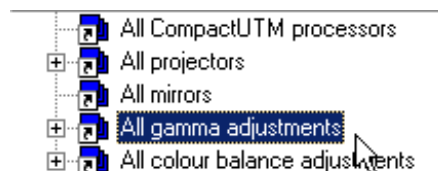
6.   Brightness.
When adjusting brightness display a dark image. For simulators a likely setting would be 10-15% daylight. Adjust brightness for all channels. Try to ignore colours and only look at the amount of light that is present.

7.   Contrast.
Before adjusting contrast change to a bright image, preferably the same image. For simulators a likely setting would be 85-90% daylight (if 15% was used for brightness, use 85% for contrast to ensure symmetry). Again try to ignore colours and only focus on light levels.

8.   Input Offset.

Changing back to a dark image, adjust colours for all channels to match. It might be necessary to go back and adjust brightness when adjusting input offset (i.e. adjusting a colour down can also take down light level sufficiently that it is necessary to increase brightness).

9.   Input Gain.

Changing back to a bright image, adjust colours for all channels to match. It might be necessary to go back and adjust contrast when adjusting input gain (i.e. adjusting a colour down can also take down light level sufficiently that it is necessary to increase contrast).

10.   Fine tuning.

By now, the projected images should be pretty well colour matched. It might be required to do some fine tuning and if so, go back to points 4 through 7. Be aware that if adjustments are very far off from default settings, you probably have gone too far in your adjustments. Input offset/gain should normally not go beyond 45 and 55.